

MODERN PACKAGING



MARCH

1944

✓ R v. 17² Mar. - Aug. 1944

"Gee! What a swell idea!"

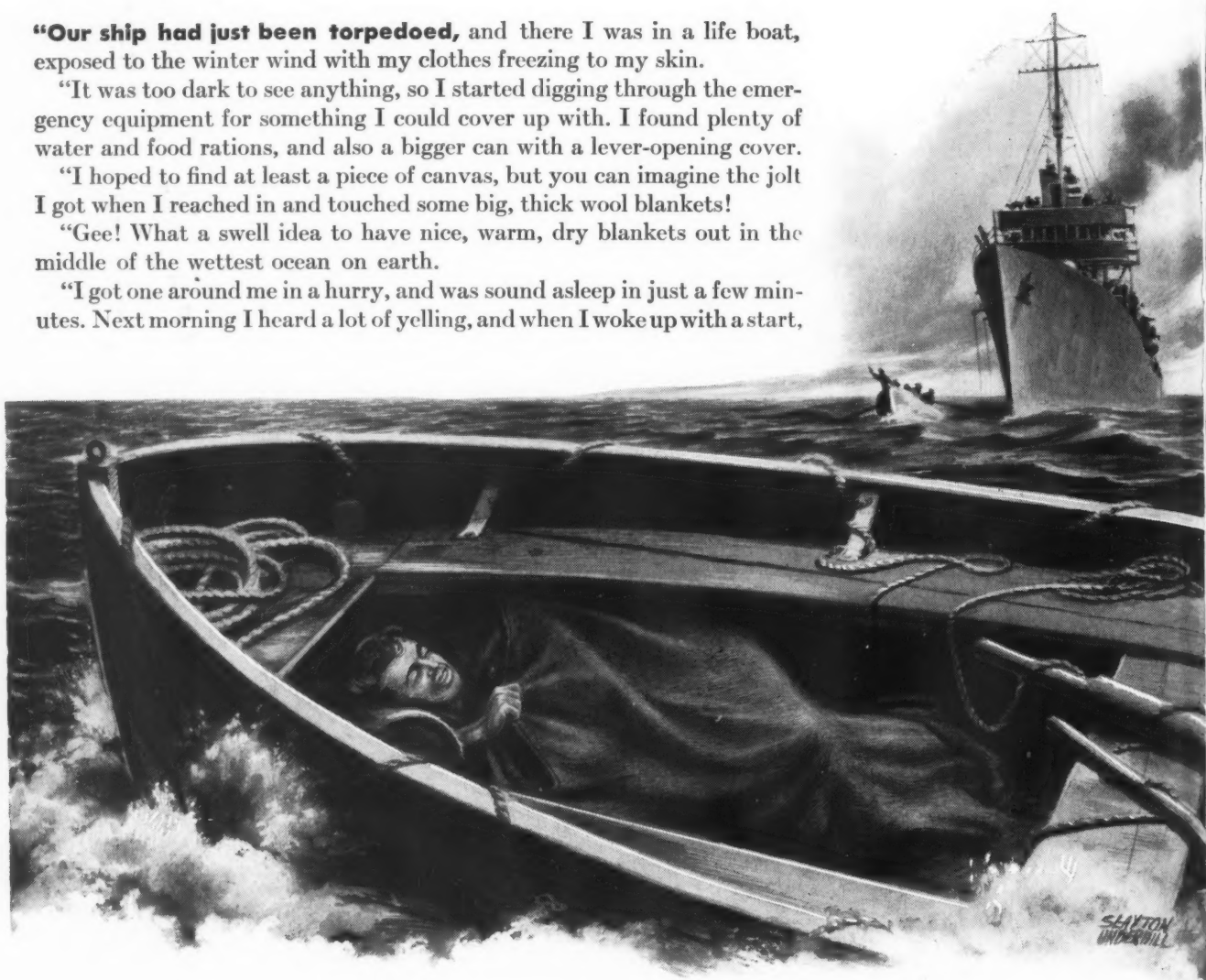
"Our ship had just been torpedoed, and there I was in a life boat, exposed to the winter wind with my clothes freezing to my skin.

"It was too dark to see anything, so I started digging through the emergency equipment for something I could cover up with. I found plenty of water and food rations, and also a bigger can with a lever-opening cover.

"I hoped to find at least a piece of canvas, but you can imagine the jolt I got when I reached in and touched some big, thick wool blankets!

"Gee! What a swell idea to have nice, warm, dry blankets out in the middle of the wettest ocean on earth.

"I got one around me in a hurry, and was sound asleep in just a few minutes. Next morning I heard a lot of yelling, and when I woke up with a start,



for a second I thought I was back home on Ma's sofa, until I saw a destroyer putting a boat out for me.

"Well, that's how it happened, and I'll say right here that whoever thought of putting canned blankets on life boats deserves the credit for my living to tell about it."



Canning blankets was an idea made into a reality by the American Can Company. These cans, all equipped with a

patented water-tight, lock-lever closure, are moving off the production lines at Canco along with hundreds of other vital war items.

More than this, Canco machine shops are devoting a great part of their time to the production of specified basic machine tools for other war needs.

Currently the amount of food packed for the armed forces and the home front shows no signs of decreasing. In fact, this year more cans for food are expected to be made than ever before.

Because of government restrictions, you will readily understand why we were forced to abandon certain types of cans, and why metal containers are no longer available for many consumer products. You are probably familiar with many of the wartime containers developed by Canco, and are using them now.

American Can Company has always been a pioneer in developing ideas on packaging, and after the war is won we hope to serve your firm by handling your packaging problems for peacetime production, too.

AMERICAN CAN COMPANY
230 PARK AVENUE, NEW YORK 17, N. Y.



CONTRIBUTE YOUR BLOOD TO THE RED CROSS

As you read this advertisement—stop and think—your blood could save the life of a wounded American soldier! If you live in or near one of the 35 cities in which blood-donor centers are located, call and make an appointment.

dech

Drug

Soldiers at the fighting front and workers on the production front must be kept in "fighting trim" every hour of every day if the rigorous schedules of war are to be maintained . . . and bettered. Medical supplies, because they mean "good health" to fighters and workers, are important commodities of victory. Depend upon us to serve manufacturers of pharmaceutical products to the very best of our ability during this exacting period. Phoenix Metal Cap Co., Chicago and Brooklyn.



Elmer Jacobs

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MODERN PACKAGING

VOLUME 17

MARCH 1944

NUMBER 7

THIS MONTH'S COVER



This month our cover is a tribute to the Red Cross, whose good deeds shine like a beacon in a strife-filled world, whose work is carried on with utter selfless devotion and with complete disregard of

racial and national barriers.

That work involves package material in great quantities. Red Cross volunteer units to the number of many thousand, all over the United States, constantly prepare packages to be sent to our men overseas. These gifts during 1943 called for over 7,000,000 fibre containers, and at least an equal number of cans and cartons. Four million and more blood plasma units in the same period required containers of tin, fibre and glass—all sent on errands of mercy.

We were proud to publish this cover when it first appeared (April 1942) and proudly we repeat it in honor of an organization that wages incessant warfare against human misery. Photo by Robert Keene.



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*“Out of difficulties
grow miracles”*

BRUYERE

Wise, indeed, were the words of this great Frenchman. For out of today's ordnance difficulties and problems have come miracles in tools of war. Redington is proud to play its part in turning out these vitally needed war products. At the same time our engineering staff has acquired new skills that will be invaluable when Post-War improvements in packaging greet the world. Many of these new packages will be mass-produced on Redington machines backed by 47 years of pioneering in packaging efficiency. F. B. REDINGTON CO. (Est. 1897), 110-112 So. Sangamon St., Chicago, Ill.

REDINGTON

PACKAGING MACHINES

FOR CARTONING • WRAPPING • SPECIAL PACKAGING

For permanent protection ...

METALAM



DOBECKMUN SPECIALTIES

Package design—the right combination of material, shape and design to provide protection, attractiveness and utility.

Cellophane bags—from ounces to gallons; printed or plain; single or duplex; flats, squares or satchels.

"Tritect" cellophane — wax-laminated film for extra protection, in rolls, sheets or bags.

Metalam—pure metal permanently bonded to tough acetate film, to give your product positive protection.

Printed films and foils — in sheets and rolls.

Laboratory testing — complete facilities for pretesting packages under all conditions of climate and service, to insure the right answer in advance.

TO answer the demand for complete protection for hygroscopic products, Dobeckmun created some years ago a new, flexible, heat-sealed, laminated aluminum foil. Now, looking forward to the time when aluminum foil and suitable films may become available for commercial use, we are giving this new and outstanding material a new name—METALAM.

Metalam is pure metal, permanently reinforced by acetate. The metal barrier is impervious to moisture. The transparent acetate supports the foil and permits attractive, multicolor printing on the package.

Countless tons of Army instant coffee and dehydrated lemon drink products have been permanently sealed in "Metalam." Even effervescent powders have been shipped to the Tropics with perfect safety. Any "intolerant" product that must be held to a fixed moisture content receives complete and permanent protection in Metalam.

When aluminum and the necessary films become noncritical materials, you will be able to obtain Metalam in rolls for automatic packaging or in sheet and bag forms. To give your product positive protection—plan on Metalam.

CONVERTERS—PRINTERS—LAMINATORS of films and foils

THE **DOBECKMUN** COMPANY

CLEVELAND 13, OHIO

WESTERN SALES HEADQUARTERS • SAN FRANCISCO

MANY MANUFACTURERS REPORT BETTER SUCCESS WITH YOUR CONTAINERS AND CLOSURES. WHY, MR. JENSEN?

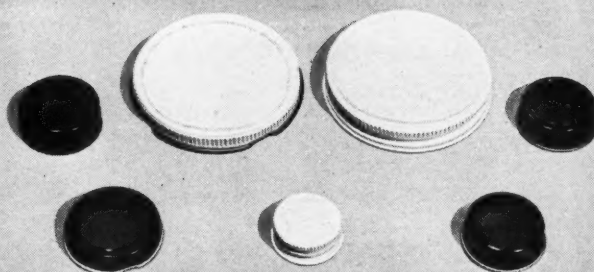
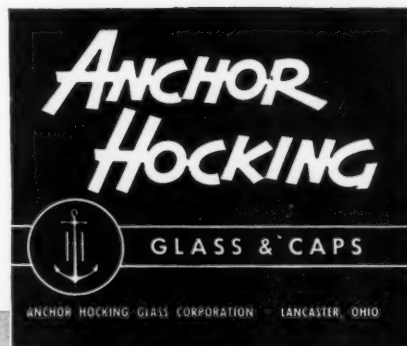
BECAUSE WE HAVE THE KNOW-HOW



Anchor Hocking has long led in the engineering development of better glass containers, closures, and packaging methods. Our research facilities are tirelessly at work, our laboratories always ready to help manufacturers with their individual problems. Anchor Hocking glass containers and caps are manufactured under exacting control—in conformity with management's uncompromising standards—by highly skilled, precision workers who have been with the company 10, 20 years or more. Those are some of the reasons why Anchor Hocking containers and closures bring drug and chemical manufacturers "better success"...why they perform so well on the production line...why they are safe and economical...why they withstand the hard knocks of production, handling and transportation.

"Meet Corliss Archer" every Saturday afternoon, entire coast-to-coast network CBS.

N. J. JENSEN, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 12 years.



every scratch is fatal

Scratches are fatal because they mean rejections! In the case of bronze bearings and bushings for important war-time requirements, scratches occurred when these items came in contact with each other during various phases of production and shipment. The answer? An H & D war-time packaging development that provides positive product protection throughout the entire production and shipping cycle.

H & D Package Engineers are not only devoting much time to war-time packaging but are also turning their attention to the packages of tomorrow.

Post-war packages must receive the same careful planning as the products entrusted to them for safe arrival. Damaged deliveries never create customer good-will. So plan *now* for your post-war packages, and plan to use corrugated boxes that both protect and promote your products. H & D's vast storehouse of war-time packaging information is available now for planning peacetime packaging. Write today.

BUY WAR BONDS — YOUR SAFEST INVESTMENT

For postwar packaging... better see

AUTHORITY ON PACKAGING...



HINDE & DAUCH

CORRUGATED SHIPPING BOXES

Tells HOW to PACK War Materials in Corrugated Boxes

The chief requirement in packaging war goods is to get as much essential material to specified destinations in the fastest, safest, most economical way. "How to PACK WAR MATERIALS in Corrugated Boxes" tells how H & D boxes are ef-



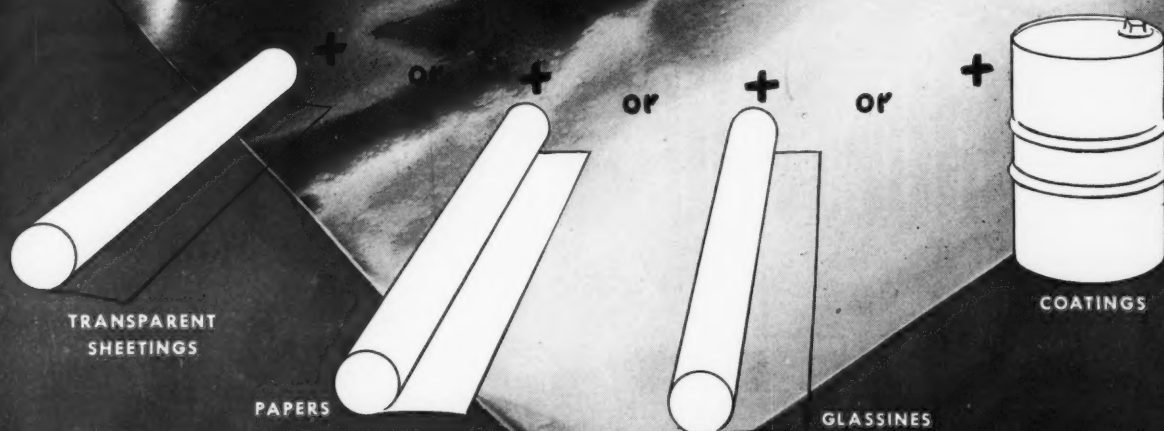
fecting new shipping efficiencies and economies in important war packaging assignments. Get copies of this and other H & D Little Packaging Library booklets by writing The Hinde & Dauch Paper Company, Executive Offices, 4414 Decatur St., Sandusky, O.

• • •

FACTORIES in Baltimore • Boston • Buffalo • Chicago
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After the war
maybe $f+x$ is your answer

Aluminum Foil



Let f equal Alcoa Aluminum Foil.
Let x equal a material to go with it.

Either one may do a good job by itself, but combine them and you may have the very *best* answer to your packaging problem, a material better than either f or x alone.

For instance, after the war you may want to heat-seal your product in a truly moisture-vaporproof package. Aluminum foil is the best barrier to moisture-vapor, but plain foil won't

heat-seal. Other membranes that *will* heat-seal are deficient in moisture-vapor resistance. Team them up and your problem is solved.

Other combinations can be made to meet other deficiencies inherent in the materials individually . . . or to produce packages that are more attractive. By thinking of transparent sheetings, papers, glassines and coatings not as rivals but as teammates of foil, a wealth of information has been uncovered to help you package your products better in days to come.

If you are thinking in that direction now, our facts and experience may be helpful. Write ALUMINUM COMPANY OF AMERICA, 2129 Gulf Building, Pittsburgh, Pennsylvania.



ALCOA *Aluminum Foil*




GAIR BY AIR

New York to San Francisco 17 hours—
New York to Hongkong 44 hours. Dis-
tance is no longer measured by miles
but by minutes. Because weight is a
first consideration, Gair products play
a vital part in the field of ever narrow-
ing horizons. New merchandising meth-
ods, bringing an unprecedented need
for Gair Corrugated Boxes—assure
maximum air cargo at minimum tonnage.



Write for Booklet "Air Cargoes"
Save Waste Paper for war production



ROBERT GAIR COMPANY, INC., NEW YORK, Gair Company, Canada, Limited, Toronto • Folding Cartons • Boxboards • Fibre and Corrugated Shipping Containers



What solved the war's most
difficult moistureproof packaging

problem?



What keeps carrots

garden-fresh for 18 months?



What's

going to revolutionize fruit, vegetable

and food marketing after victory?



What packaging will the

smartest postwar merchandisers

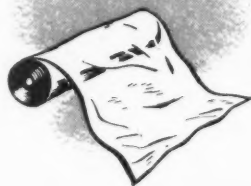
use on everything from precision

instruments to peanuts?



To seal

moisture in, or seal it out?



THE ANSWER, OF COURSE, IS



Pliofilm

A PRODUCT OF GOODYEAR RESEARCH

Let's all
Back the Attack
with War Bonds

Pliofilm—T.M. The Goodyear Tire & Rubber Company



Get the answer to your postwar packaging problem
BOOTHS 102-103-104, PACKAGING EXPOSITION, Palmer House, Chicago, March 28-31



Copyrighted. Reprinted permission The New Yorker

Hold it, Herman

... you jejune juvenile joy-killer! You don't know how d— lucky you were to have cardboard toys last Christmas. It was either cardboard or a rain check from S. Claus, which would have served you right! ... And many a patriotic distiller, mattress maker and drug company gave up window displays so you could have toys.

Next Christmas, for all we know, the five-and-ten may be full of alluring aluminum *objets d'art* and lovely lethal playthings of tool steel. But right now

cardboard is precious stuff, and who are you to hold a proud proboscis toward it? In fact, if your youthful imagination entertains the idea of ever being an Eagle Scout, you better hump yourself and save all the cardboard you can honestly lay your grubby hands on! Newspapers, magazines, paper bags and wrappers, too!

AFTER this slightly patriotic plug, may we add a slightly commercial aside? As one of the principal makers of cardboard toys for the last year, it

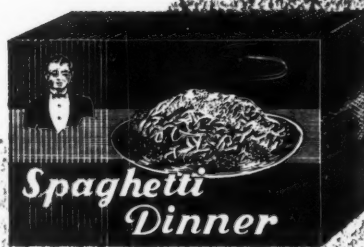
was a source of considerable pride to us to note that just prior to Christmas Eve, when all the salesgirls have sore feet and toy departments try to clear remnant stocks with cut prices ... Einson-Freeman items met with no markdowns, were definitely blue chip in a bear market.

Our Cockpit Trainers and other toy items are still moving lively at list prices. You can't kid the kids on Quality! Not that we ever tried to kid anybody on that score—not even our most credulous competitors!

Einson-Freeman Co., INC. • LONG LASTING LITHOGRAPHERS

STARR AND BORDEN AVENUES, LONG ISLAND CITY, NEW YORK

Essential FOOD PACKAGING



BY R. T. G.

FOOD, FOOD and yet more FOOD is essential. But how to package it? Metal is out, paperboard is scarce and the "know how" is even scarcer.

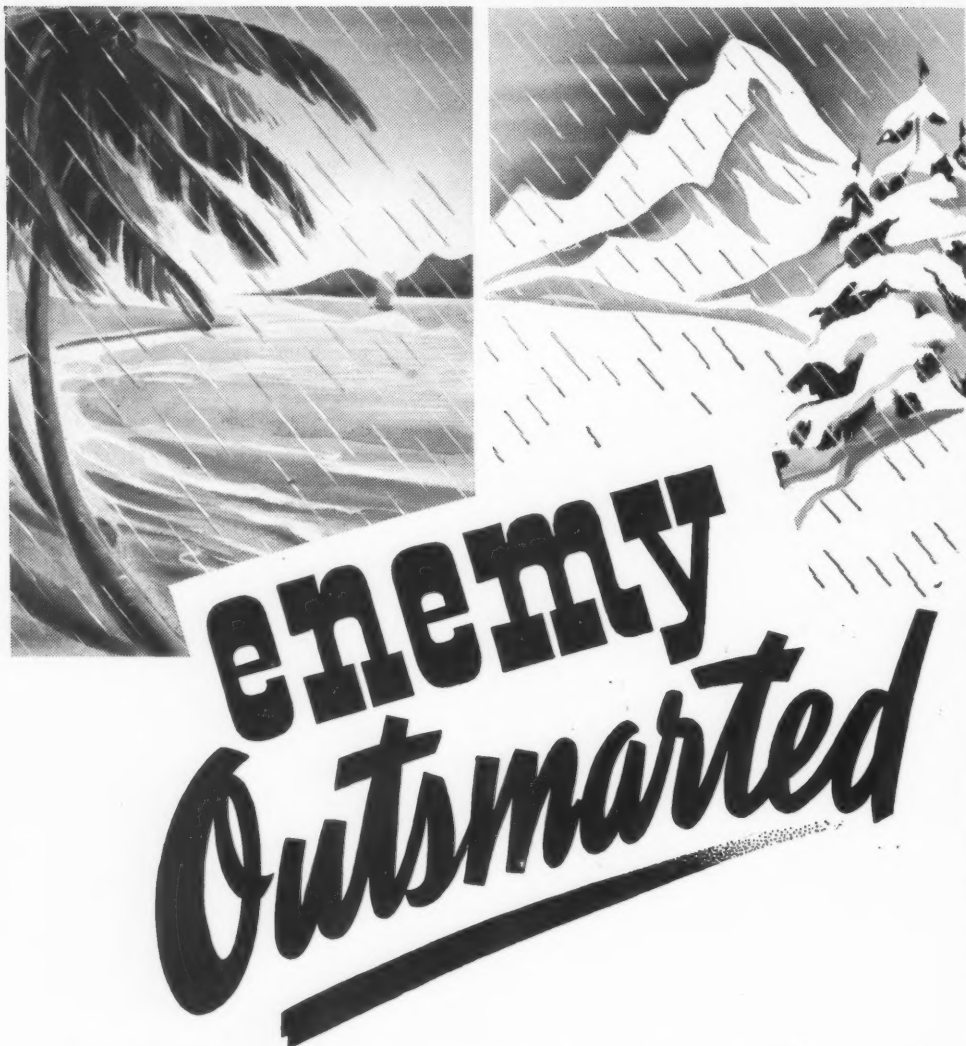
Now, more than ever before, service and quality count.

The R. T. G. organization was built upon that basis.



THE
RICHARDSON · TAYLOR · GLOBE
CORPORATION

1501 WEST MITCHELL AVENUE · CINCINNATI 32 · OHIO



MOISTURE—enemy of shipping conquered by SOLSEAL waterproof tape

The dramatic development of weather-proof containers to protect and deliver war-time cargoes safely despite extremes of temperature or moisture conditions, has proven one of the epics of war-time packaging. Some of these water resistant containers, constructed of fibreboard, are made to withstand . . . contents and all . . . long periods of moisture and temperature extremes without disintegrating! Nevertheless the finest of these containers would be virtually hamstrung if they lacked the proper sealing to keep both containers and contents intact. The answer is SOLSEAL Waterproof Tape which has been subjected to severe tests . . . tests which have disclosed the incredible ability of this tape to adhere to containers after weeks of submersion.



SOLSEAL Tape is applied in the same simple manner as regular tape, using the same type of moistening dispenser. Special Solseal Solvent, used as a moistening agent, is a non-inflammable, non-corrosive mixture of chemicals that, will, upon wetting Solseal Tape, cause it to become water-proof. The tape when applied, practically cements itself to the package. Tests, made at wide ranges of temperature have resulted in no injury to the bond, which remains intact despite prolonged, repeated immersion and drying. Solseal is available in 30/30/30, 60/30/30 and string-filled. Also available as STAYCOR SOLSEAL for the manufacturer's joints of corrugated cartons. If desired, SOLSEAL Adhesive can be applied on light weight papers for label use. We'll be glad to furnish sample coils together with Solseal Solvent.

SOLSEAL



McLAURIN-JONES COMPANY - BROOKFIELD - MASS.

**OTHER
McLAURIN-JONES**

*Wartime
Papers*

INCLUDE:



**ALCOSEAL
LABEL PAPER**

(WATER-RESISTANT)

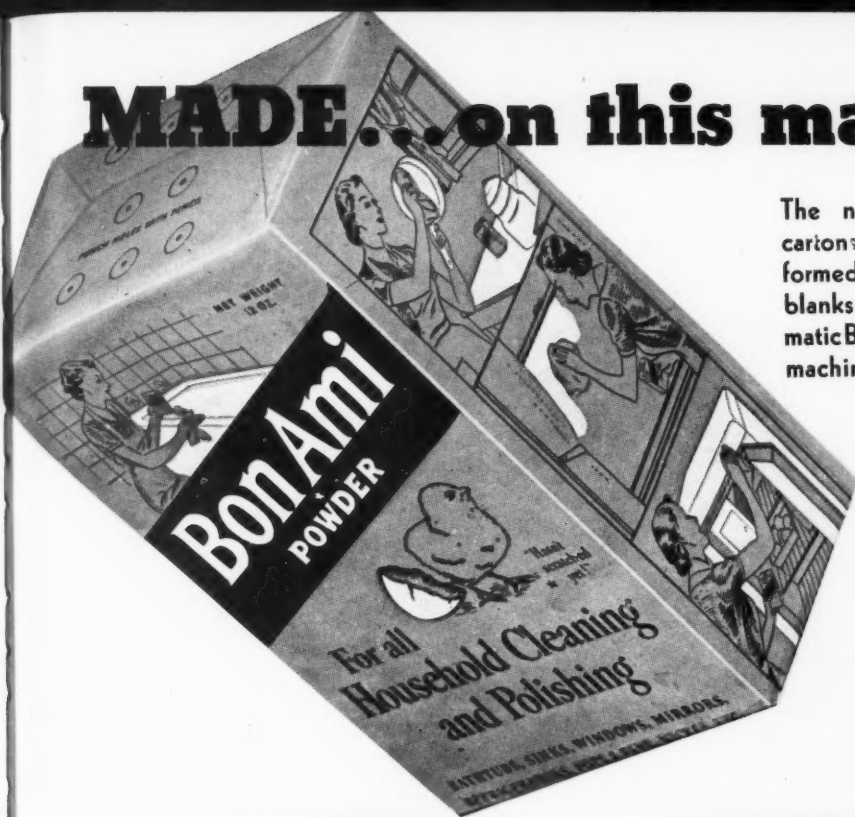
STICKS PERMANENTLY TO METAL, plastics, and most other smooth surfaces. It provides a firm, water-resistant bond and is valuable for labeling merchandise destined for overseas shipment. Alcoséal paper is coated for efficient, economical application with ordinary denatured alcohol or heat. Test samples supplied upon request.

**HEAT SEAL
FOOD LABEL**

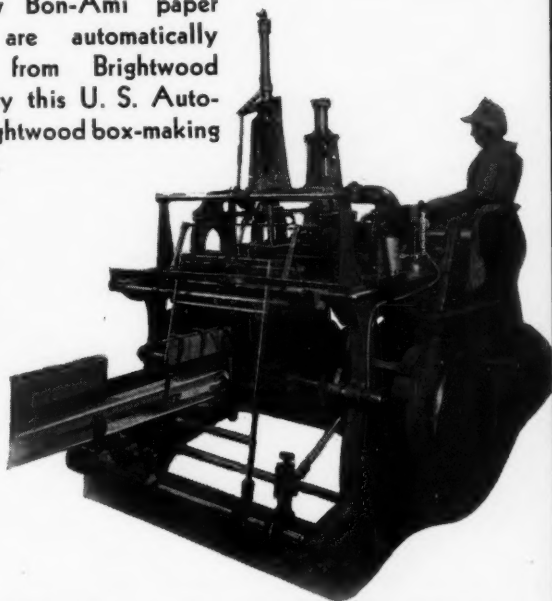
Paper developed as a result of government instructions to packers to place bands on frankfurters, sausages and other prepared meats in conformity with Pure Food laws. Odorless—therefore particularly adapted for labeling food. Temperature for proper sealing depends upon length of time of contact with heating element and amount of pressure applied, but 200°F appears to be satisfactory on most equipment. Sticks to moistureproof cellophane at 200°F. Send for test samples.

TAPE is manufactured by the following: Atlantic Gummed Paper Corp., Brooklyn, N. Y.; The Brown-Bridge Mills, Inc., Troy, Ohio; Central Paper Company, Menasha, Wis.; Edgewater Paper Company, Menasha, Wis.; McLaurin-Jones Co., Brookfield, Mass.; Mid-States Gummed Paper Co., Chicago, Ill.; Nashua Gummed & Coated Paper Co., Nashua, N. H.; Rexford Paper Co., Milwaukee, Wis.; The Gummed Products Company, Troy, Ohio; Thomas Stationery Mfg. Co., Springfield, Ohio.

MADE...on this machine ↓

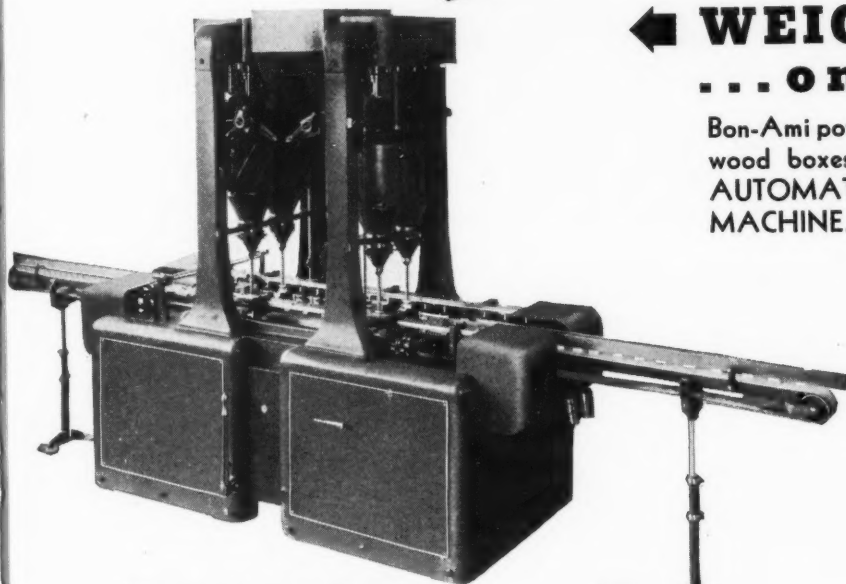


The new Bon-Ami paper cartons are automatically formed from Brightwood blanks by this U. S. Automatic Brightwood box-making machine.



← WEIGHED & FILLED ...on this machine

Bon-Ami powder is weighed and filled into the Brightwood boxes on this U. S. MODEL JN BOND AUTOMATIC GROSS WEIGHT PACKING MACHINE.

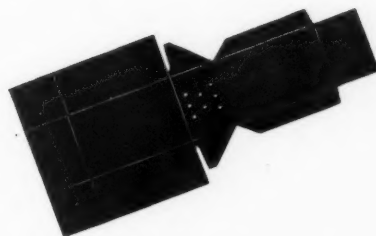
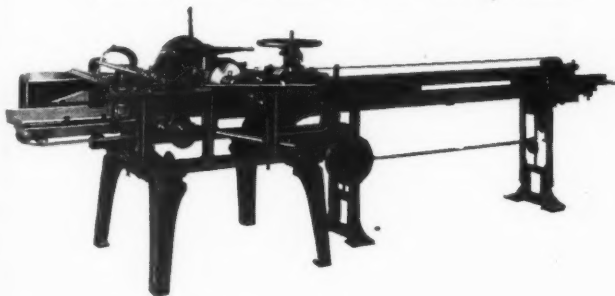


BRIGHTWOOD BLANK ↓

which makes Bon-Ami package. These blanks save material by interlocking in the cutting and creasing operations. They save gluing operations by setting up the bottoms and sides at the same time on the Brightwood, thus getting a solid leak proof bottom.

SEALED . . . ↓

The U. S. Automatic carton sealer finishes the automatic packing and weighing of Bon-Ami powder.



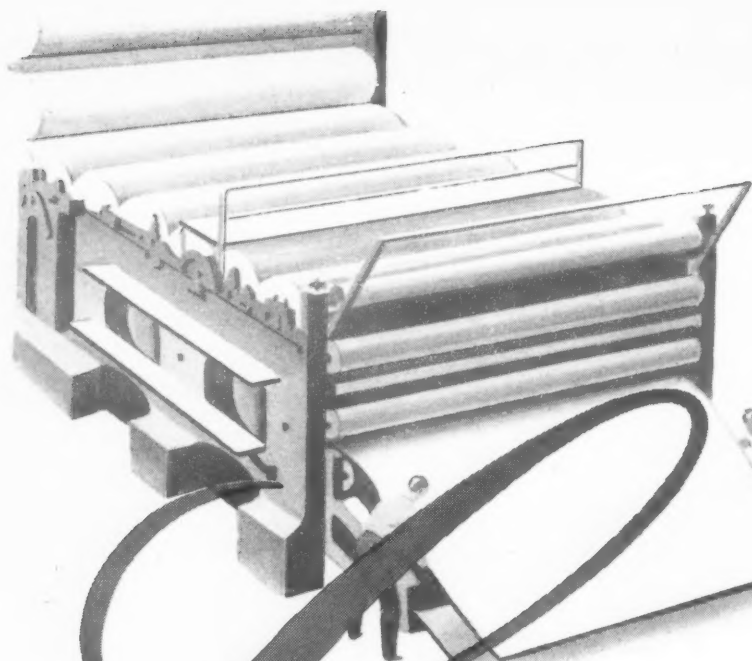
This automatic high-speed production line illustrates what U. S. Automatic equipment can do in a packaging plant. Send for further information.

UNITED STATES AUTOMATIC BOX MACHINERY CO., INC.

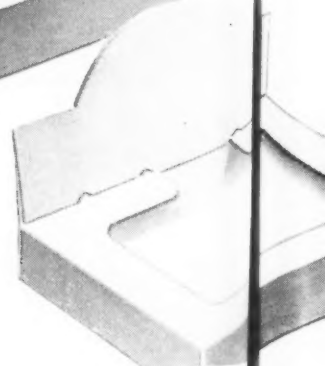
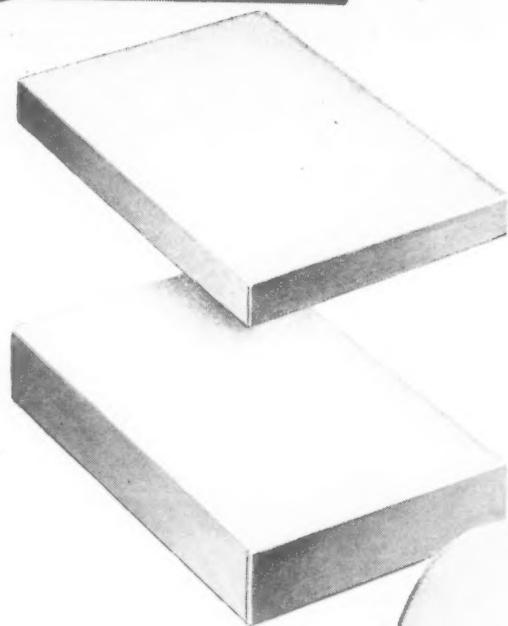
owning and operating

National Packaging Machinery Co. — Cartoning Machinery Corp.

18 Arboretum Road (Roslindale) Boston, Mass. Branch Offices: New York, Cleveland, Chicago



Coated



Lithwite

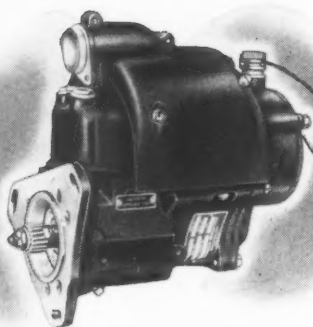
An entirely new and different type of carton board for *postwar packaging*. *Coated Lithwite* is the first paperboard ever to be made, formed and coated on one machine in one continuous operation. This revolutionary development not only produces, at incredibly high speed, a finer, whiter, more economical board but one with unusual printing, folding and sealing qualities as well.

The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard
MIDDLETOWN, OHIO



Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT



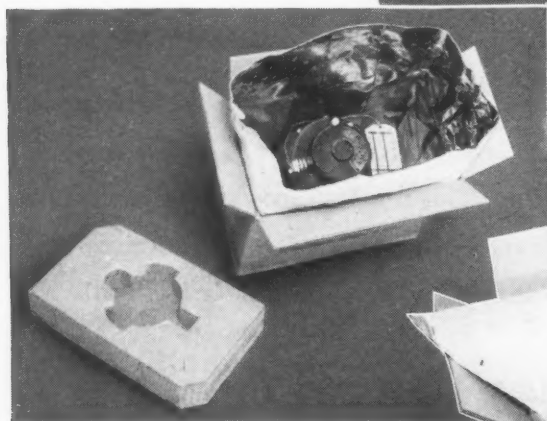
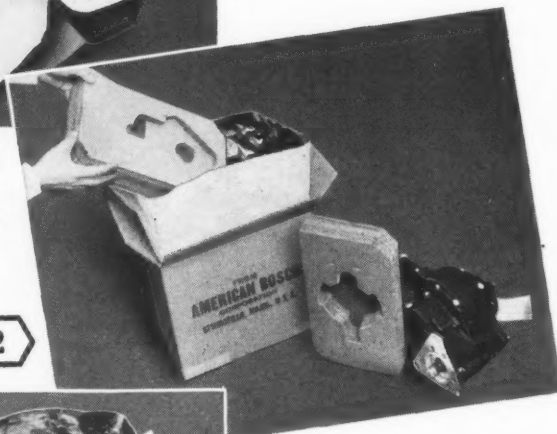
**SHIP ME SOMEWHERE
EAST OF SUEZ
..and ship me
FIT TO FIGHT!**



1 American Bosch Aviation Magneto with U.S.E.-Butvar Bag, reinforcing "nests," and carton ready for packing.

U.S.E.-Butvar Bag is placed in carton, and magneto rests on bottom nest.

2



3 Magneto in place within U.S.E.-Butvar Bag, ready for top nest.



4

Top edges of U.S.E.-Butvar Bag are heat sealed, the bag is folded in, and carton is sealed—ready for shipment *anywhere*.

The U.S.E.-Butvar Film Bag may be the answer to your heavy parts packing problem . . . if you need water-moisture-vapor proofing, with the ruggedness made possible by sturdy cloth, adhesive, dense Kraft paper, asphaltum compound, solid alloyed lead foil, and the heat-sealing Butvar Film. May we give you complete data?

P-1

UNITED STATES ENVELOPE CO.
General Offices
SPRINGFIELD 2, MASSACHUSETTS

U*S*E *protective packaging*

Products of United States Envelope Company include WAR PRODUCT PACKAGING • TRANSPARENT CONTAINERS • ENVELOPES
WRITING PAPER • LINWEAVE PAPERS • NOTE BOOKS • PAPER CUPS • TOILET TISSUE • PAPER TOWELS



**REYNOLDS METAL
PACKAGING MATERIAL IS
BATTLE-TESTED
TO MEET YOUR PACKAGING
PROBLEMS**

REYNOLDS METALS

Reynolds' foresight and ingenuity combined to give America a great new source of aluminum. Because of this proved ability to look ahead, it was only natural that Reynolds, the world's largest foil producer, was asked to help solve the tremendous problem of wartime packaging. Again Reynolds came through...this time with a new type "fighting-foil," now protecting food, drugs, munitions, and supplies on all fronts. Reynolds new packaging material is really *armor-clad protection without the use of steel.*

Our reservoir of packaging experience, enriched by global research, is your dependable source today for product packaging and market development assistance. We are now collaborating with manufacturers in many fields on foil's manifold postwar uses. May we help you? Consult our representatives in any of the larger cities, or write direct to us.

REYNOLDS METALS COMPANY • FOIL DIVISION • GENERAL OFFICES • RICHMOND, VA.

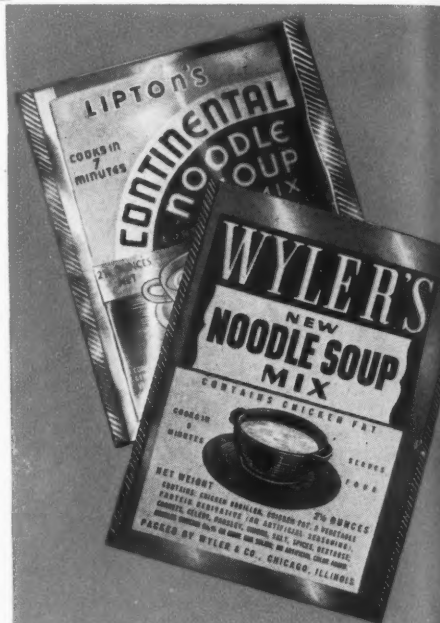
TITEWRAPS

Reynolds Titewraps insure high speed production. Heat, glue or wax sealed. Moisture-vapor proof. Multi-color gravure printing. Proof against moisture, heat, light, insects.



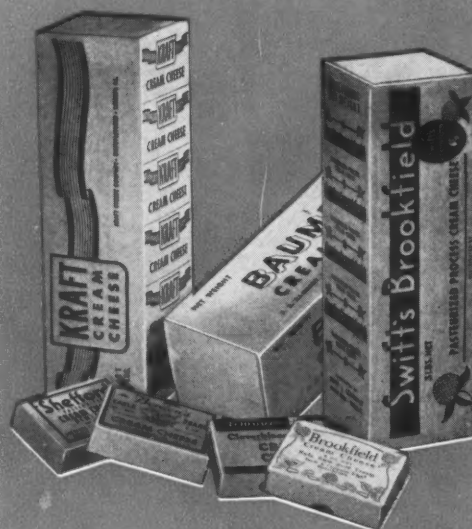
CARTONS, CANISTERS and CONTAINERS

Reynolds special patented "Pour-it" top cartons. Foil-lined or foil-laminated to special stocks. Also ply-metal cartons (foil inside and out.)



DAIRY PRODUCTS

Foil is recognized as the practical wrap for soft cheeses. Until government restrictions are eased, Reynolds is prepared to supply cheese wraps of the best materials available.



CHEWING GUM and CANDY WRAPPERS

High speed wrapping is facilitated by Reynolds precision-cut wraps. In both sheets and rolls, printed in multicolor gravure.

PACKAGING SERVICE



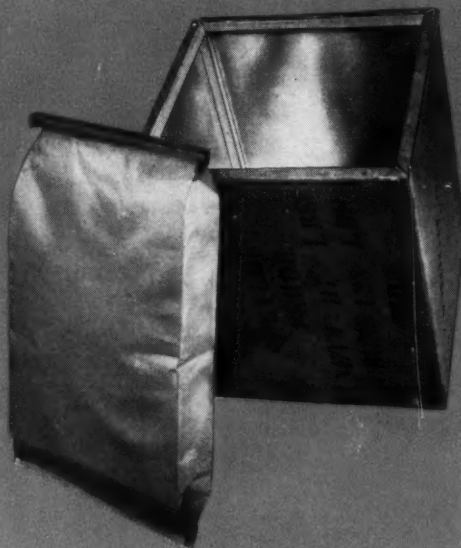
LABELS

Reynolds supplies both square and die-cut labels, also embossed labels, printed in finest quality multi-color gravure.



BAGS

Reynolds produces the nation's outstanding heat sealed envelopes and bags for dehydrated foods, drugs, chemicals, etc. Investigate the many types of Reynolds bag and envelope constructions.



BULK PACKAGING

Foil-lined, strong, reinforced fibre container for safe shipment of valuable merchandise such as tea, etc... Moisture proof material for manufacture of multiwall bags for use in the shipment of such items as dry chemicals, flour, cement and other hygroscopic products.



TOBACCO PACKAGING

Until restrictions are lifted, wraps and cartons are available in non-priority materials. Consult our tobacco packaging experts about post-war tobacco packaging research now being conducted.



Reynolds Metal Packaging Material Meets These Army-Navy Requirements

- 1 Positive Protection Against Moisture-Vapor Transmission.**
- 2 Immersion-Proof. Keeps Water Out!**
- 3 Protection Against Insect Infestation, Odors and Light.**
- 4 Substantial Saving in Tin, Steel and Other Strategic Materials.**
- 5 Saving in Space, Especially Shipment and Storage of Empties.**
- 6 Saving in Weight.**
- 7 Serviceability Under Export Conditions.**

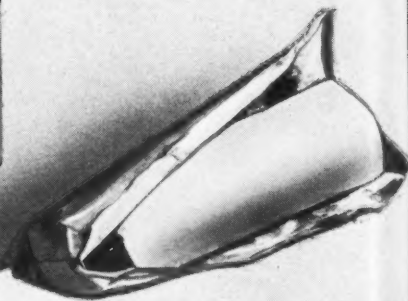
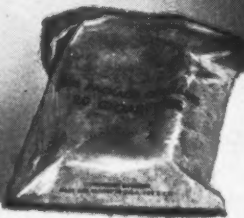
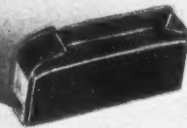
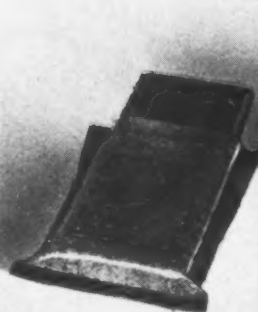
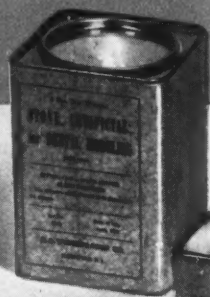
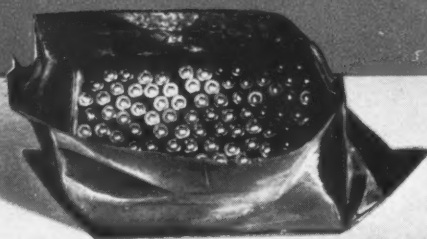
LIPTON'S
CONDENSED
NAVY BEAN SOUP
BIRMINGHAM

Prepared by Lipton's Condensed Soup Co., Ltd., London, England.
Manufactured by Lipton's Condensed Soup Co., Ltd., London, England.
This soup is made from the finest quality beans and vegetables.
It is a delicious and nourishing food, and is especially adapted for use in the home.
It is also a valuable food for the sick and convalescent.

Prepared by Lipton's Condensed Soup Co., Ltd., London, England.
Manufactured by Lipton's Condensed Soup Co., Ltd., London, England.

MADE IN ENGLAND

LIPTON'S CONDENSED SOUP CO., LTD., LONDON, ENGLAND.
SOLE IMPORTERS FOR THE UNITED STATES
LIPTON'S CONDENSED SOUP CO., LTD., LONDON, ENGLAND.



Reynolds Metals specializes in foil for all packaging needs: In sheets or rolls, plain, decorated, embossed or laminated to a wide range of other materials.



THE ILLUSION OF QUANTITY

Trying to determine the quality of a product by the number of people employed where it is made is like evaluating a piece of music by the number of notes it contains.

Workmen in large quantity do not necessarily indicate an article of superior quality.

In the field of glass making, Carr-Lowrey has never been numbered among the largest glass manufacturers in America. But for trustworthy and completely dependable quality, Carr-Lowrey containers have long received an A-1 rating among men who know glass best.

Manufacturers of drugs, cosmetics, food or household products will find the facilities of this compact, quality-minded organization a real aid in interpreting their glass container requirements realistically, economically and dramatically!

**CARR-LOWREY
GLASS CO.**

Packaging problem?

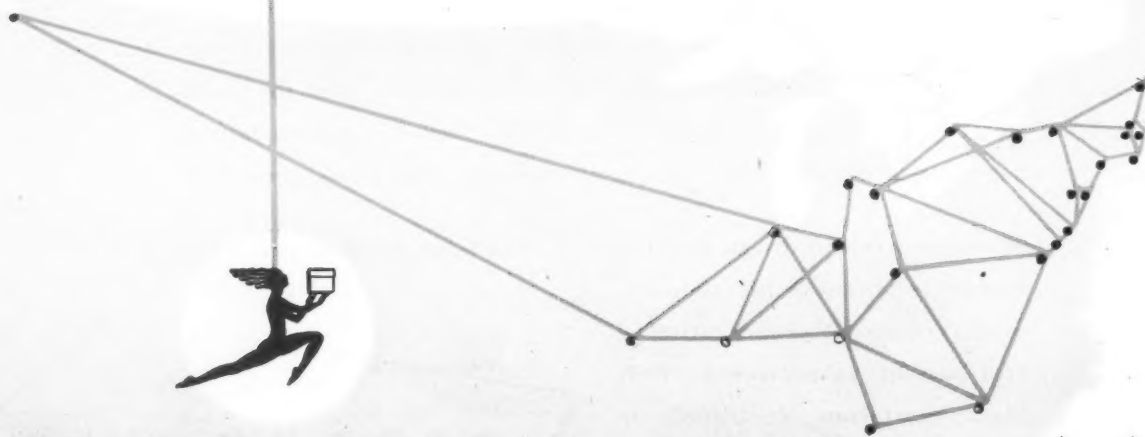
Plug into this network for the right answer

● The nearest Master Craftsman is a man who can give you not only service, but valuable information. For, in addition to his own facilities, he is a member of a network which comprises *all* facilities for the manufacture of set-up paper boxes.

The set-up box is made in a multitude of forms. Not all Master Craftsmen produce every type of set-up box, but all are creative manufacturers who welcome problems in design as well as production . . . and can plug into their own network immediately for supplementary service from colleagues.

Call your nearest Master Craftsman. *Designs and samples of post-war packages are being created now.*

Master



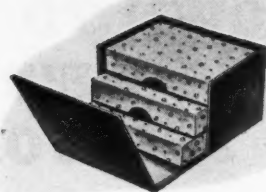
★ ★

★ ★ ★

DON'T STOP TILL IT'S OVER—BUY WAR BONDS!

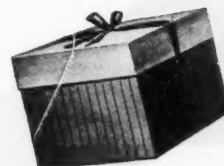
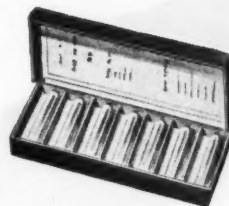
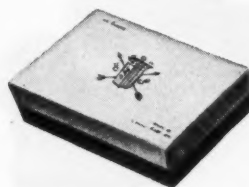
Are you facing a merchandising and packaging problem in connection with

Toys	Artists' Supplies
Cosmetics	Cigarettes
Games	Tobacco
Perfume	Cigars
Leather Goods	Pens, Pencils
Small Instruments	Toilet Articles
Stationery	Jewelry
Hosiery	Small Hardware
Shirts	Drugs
Shoes	? ? ? ? ?
Candy	



● You have not begun to explore packaging possibilities until you have studied the adaptable, economical, attractive types of set-up paper boxes ... the more sales-appealing because of an infinite choice of covering papers.

A few of the many kinds of set-up paper boxes. What sort of package will your product require?



Craftsmen

OF THE SET-UP PAPER BOX INDUSTRY

● Master Craftsmen of the Set-Up Paper Box Industry are the leaders within the industry ... the men who are creative, the men who are not restricted in their thinking by what has been done, but are broad enough in their thinking to tackle new problems, envisaging what can be done. You will find any Master Craftsman a helpful, progressive, energetic planner as well as producer. And he produces economically, keeps his prices well within the limits found throughout the industry as a whole.

BALTIMORE, MD.
Maryland Paper Box Co.
BOSTON, MASS.
Bicknell & Fuller Paper Box Co.
BROOKLYN, N. Y.
Specialty Paper Box Co.
E. J. Trum Co., Inc.
BUFFALO, N. Y.
Thoma Paper Box Co.
CHARLOTTE, N. C.
Old Dominion Box Co.
CHATTANOOGA, TENN.
Atlas Paper Box Co.
CHICAGO, ILL.
Krook Paper Box Co.
COLUMBUS, OHIO
Columbus Paper Box Co.

DANVERS, MASS.
Friend Paper Box Co.
DETROIT, MICH.
Stecker Paper Box Co.
FORT WAYNE, IND.
Fort Wayne Paper Box & Printing Corp.
HOBOKEN, N. J.
Shoup-Owens, Inc.
KANSAS CITY, MO.
Crook Paper Box Co.
LOUISVILLE, KY.
Finger Paper Box Co.
Kentucky Paper Box Co.
MERIDEN, CONN.
Shaw Paper Box Co.

NEWARK, N. J.
Mooney & Mooney
Newark Paper Box Co.
NEW YORK, N. Y.
A. Dorfman Co.
PAWTUCKET, R. I.
Shaw Paper Box Co.
PHILADELPHIA, PA.
Datz Mfg. Co.
Walter F. Miller Co., Inc.
Edwin J. Schoettie Co.
Geo. H. Snyder, Inc.
Sprowles & Allen, Inc.
PITTSBURGH, PA.
Keystone Box Co.
PORTLAND, ME.
Casco Paper Box Co.

PROVIDENCE, R. I.
Hope Paper Box Co.
Taylor Paper Box Co.
SEATTLE, WASH.
Puget Sound Paper Box Co.
Union Paper Box Mfg. Co.
SOMERVILLE, MASS.
Consolidated Paper Box Co.
ST. LOUIS, MO.
Great Western Paper Box Co.
Moser Paper Box Co.
F. J. Schleicher Paper Box Co.
Service Paper Box Co.
UTICA, NEW YORK
Utica Box Co., Inc.
WILMINGTON, DEL.
Wilmington Paper Box Co.

TORONTO, CANADA
The Fielder Paper Box Co., Ltd.
Cooperating Suppliers: Appleton Coated Paper Company; Blackstone Glazed Paper Company; Bradner Smith & Co.; Louis Dejonge & Co.; Hampden Glazed Paper & Card Co.; Hartford City Paper Co.; Hazen Paper Company; Holyoke Card & Paper Co.; Hughes & Hoffman Company; Lachman-Novasol Paper Co.; Marvellum Company; Matthews Paper Corp.; Nashua Gummed & Coated Paper Co.; Pelepscot Paper Co.; Plastic Coating Corp.; Racquette River Paper Co.; Stokes & Smith Co.

DOWN TO THE DOTTED LINE WE'RE JUST LIKE EVERYONE

We're completely converted to war.....we have no excess press capacity.....we can't accept any new business



BUT FROM HERE ON, WE'RE

Different

It may be the way we do business—we are addicted to the profit system, we are also planning to be here a long time.

Which means you get your money's worth, courteous treatment, close cooperation.

We live by our customers, their success is ours. A profit at their expense is a loss to us.

Plastics, properly applied and well handled, defines our present and our future. How will it affect yours? Play safe, tie the past and the future together—thru Boonton.



BOONTON MOLDING COMPANY

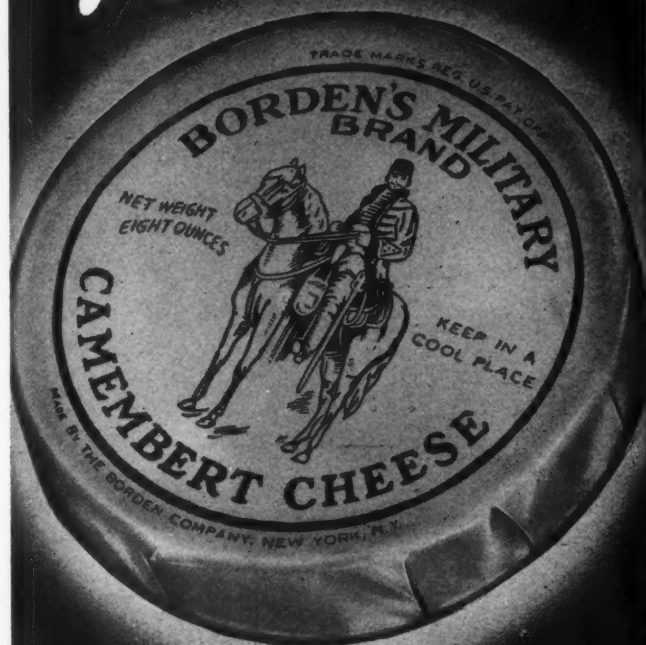
MOLDERS OF PLASTICS • PHENOLICS • UREAS • THERMO PLASTICS

BOONTON • NEW JERSEY • Tel. Boonton 8-2020

NEW YORK OFFICE

Chanin Bldg., 122 East 42nd Street, New York 17, N. Y., MUrray Hill 6-8540

New



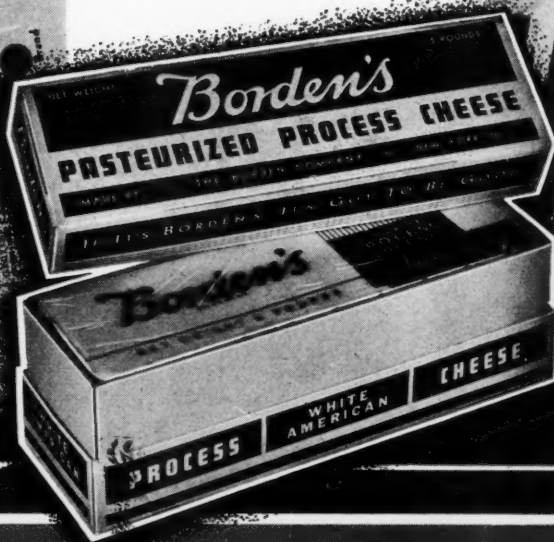
CELUMINA *Cheese Wrappers*

FOIL-LIKE BRILLIANCE with CELLOPHANE PROTECTION

A beautiful wrapper...with the bright sheen of polished silver...and a strong protective coating...tasteless...odorless...tear-resistant...that's Celumina, a replacement for war-scarce foil. Celumina has many advantages. It handles easily, wraps fast, and withstands scuffing. It unwraps in one piece and can be re-wrapped. Attractively printed in one or more colors. For camembert, blue, process and other cheeses. Ask for samples.

SPECIAL COATED CELLOPHANE POUCHES AND WRAPPERS

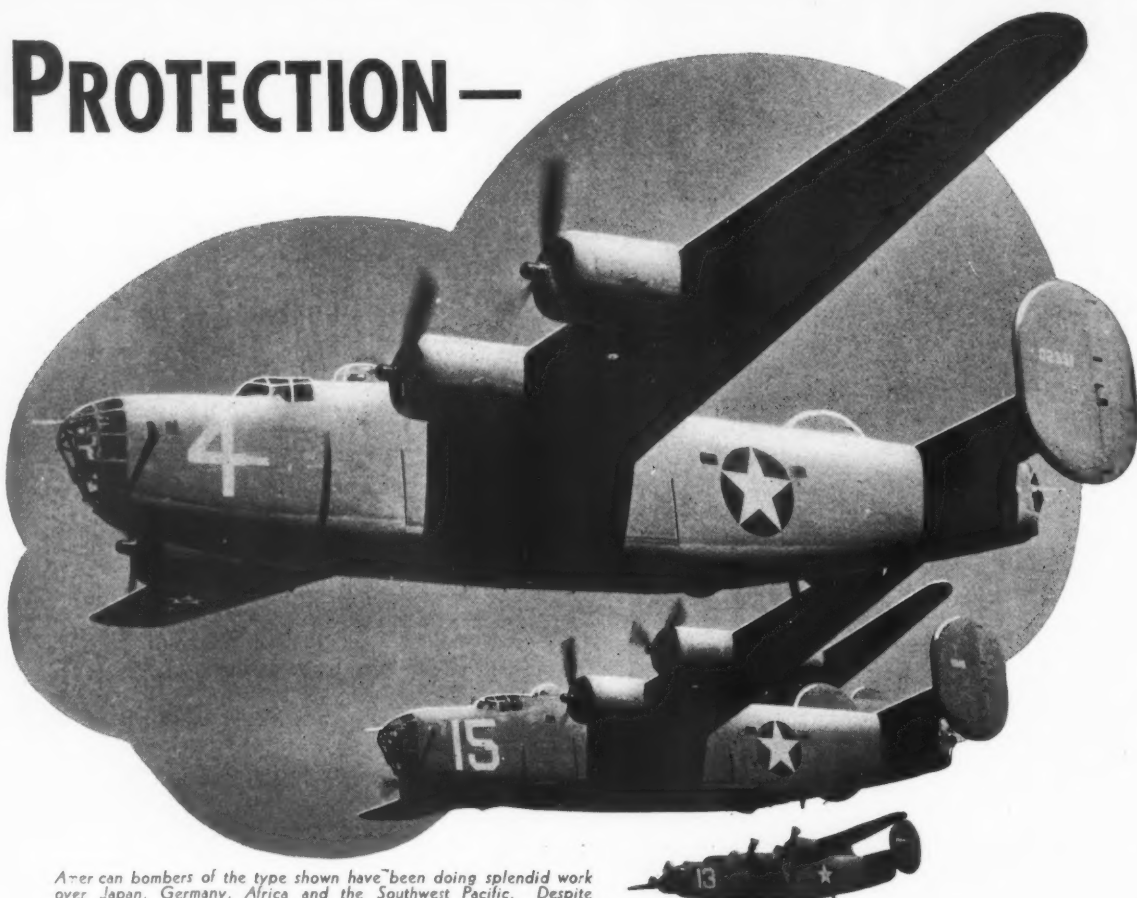
We have been supplying cheese manufacturers with transparent cellophane cheese pouches and wrappers for more than five years. These protective heat-sealed wrappers come either unprinted or printed in one, two and more colors. Sheets and pouches are furnished in any size desired.



GENERAL FELT PRODUCTS INC.

68-THIRTY FIFTH STREET • BROOKLYN (32) NEW YORK

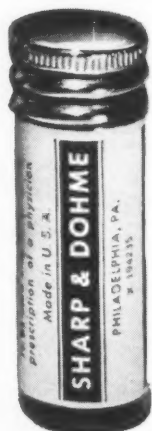
PROTECTION—



American bombers of the type shown have been doing splendid work over Japan, Germany, Africa and the Southwest Pacific. Despite ground or aerial opposition, they rarely fail to deliver their cargo.

Is inherent in SEAMLESS,
SHATTERPROOF

Clearsite*



Streamline beauty of Clearsite containers, plus a resilience that makes them *shatterproof*, offers MORE value and a greater safety factor as a package for your product. Transparent or opaque, colorfully labelled in process of manufacture; a full size range and a variety of closure styles are a few of the many features available in these

COLORFUL, DURABLE CONTAINERS

Why not get details? A staff of expert packaging consultants is at your disposal, without obligation!

* Reg. U. S. Pat. Off.

FIRST IN
CELLUPLASTICS
HYCOLOID-CLEARSITE

CELLUPLASTIC CORPORATION

60 AVENUE L

NEWARK, N. J.

The consumer will soon be back in the driver's seat...



Then (and thank Heaven) it will once again take real salesmanship, aggressive merchandising and honest-to-goodness hard work to get and build sales. ★ Will you be ready with the kind of packages, which the postwar era will require? Packages more colorful, more compelling, better designed from every standpoint? ★ The time to start planning those packages is now . . . when it can be done carefully and with consideration. To delay means the risk of competitors beating you to the draw . . . of getting bogged down in the rush and confusion when everybody is trying to do at the last minute what should have been done now. ★ This organization is ready to go to work now on your new packages. Why not get in touch with us today.

Printed Cellophane, Pliofilm, Glassine, Aluminum Foil, Coated and Laminated Papers in all forms including Sheet Wraps, Rolls, Pouches or Specialty Bags.

Revelation Bread Wraps, Specialty Folding and Window Cartons, Counter Displays, Simplex Pie and Cake Units.

MILPRINT Inc.

PACKAGING CONVERTERS • PRINTERS • LITHOGRAPHERS

PLANTS AT — MILWAUKEE
PHILADELPHIA • LOS ANGELES

SALES OFFICES IN— SAN FRANCISCO • CHICAGO
NEW YORK • PHILADELPHIA • LOS ANGELES
BOSTON • ATLANTA • ST. LOUIS • MINNEAPOLIS
CLEVELAND • CINCINNATI • PITTSBURGH
DALLAS • INDIANAPOLIS • GRAND RAPIDS



WHENEVER you wait for a shipment of tubes beyond the time you should have them, you're doing **YOUR** bit toward winning the war. For, many of the Sheffield Tubes that normally go into civilian use are now packed with vital medicinal and pharmaceutical ointments that are going on convoys to our boys on the battle fronts of the world. We're proud of our contribution to the war. IF, occasionally, you should have to wait for a tube shipment, remember we are eager to serve you just as quickly as we can!

NEW ENGLAND COLLAPSIBLE TUBE CO.

3132 S. CANAL STREET, CHICAGO 16 • NEW LONDON, CONN. • W. K. SHEFFIELD, 500 FIFTH AVENUE, NEW YORK 18
THE WILCO COMPANY, 6800 MCKINLEY AVE., LOS ANGELES 1

Irresistible!



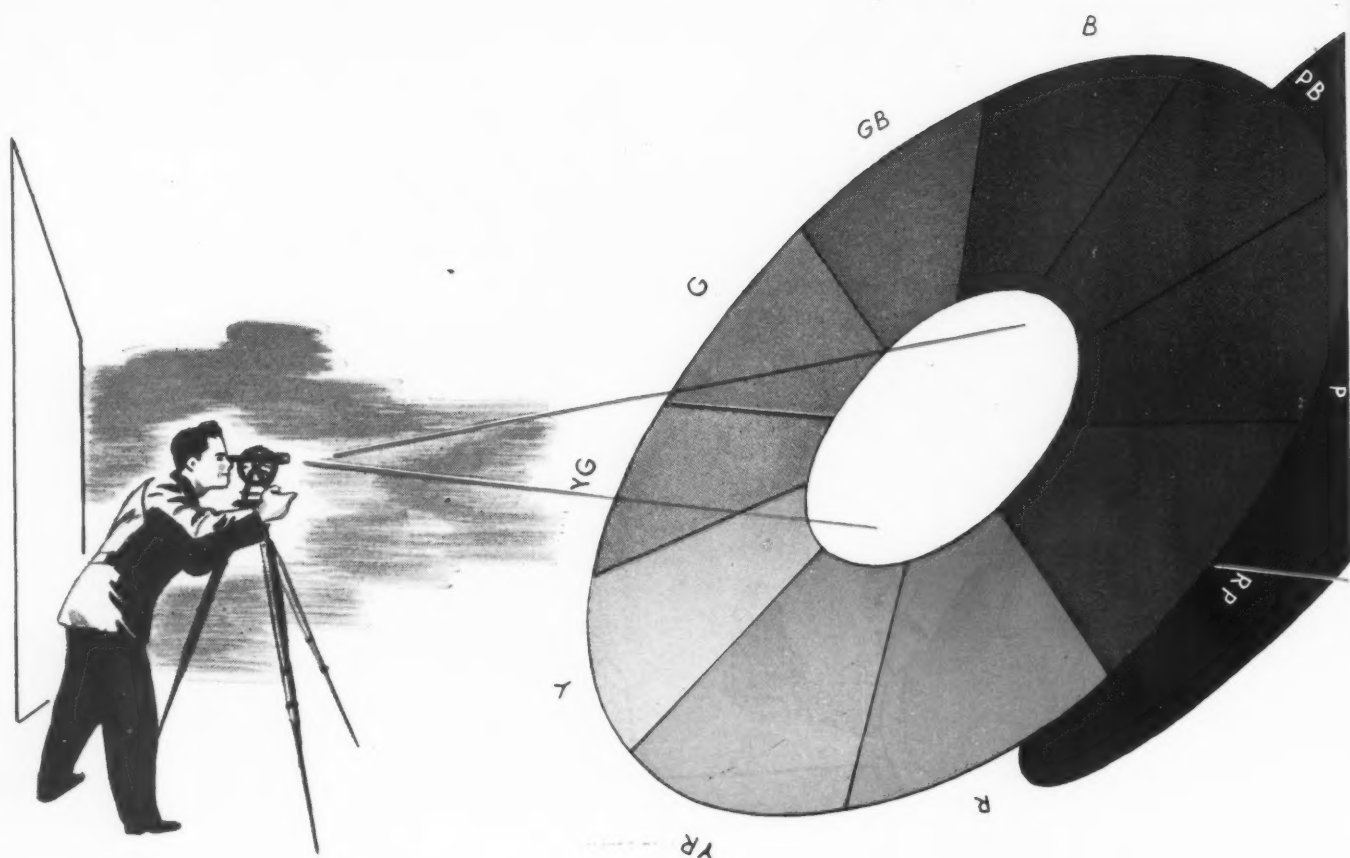
At five or fifty, they yield to the lure of smart, skillfully designed packaging. So in planning your attack on highly competitive postwar markets, remember that graceful, appealing Maryland bottles and jars have proven, over the years, their ability to win . . . and hold . . . feminine favor.

MARYLAND GLASS CORPORATION, BALTIMORE, MD. . . . New York: 270 Broadway
 . . . Chicago: Berman Bros., 1501 S. Laflin St. . . . St. Louis: H. A. Baumstark, 4030
 Chouteau Ave. . . . Memphis: S. Walter Scott, 608 McCall Building . . . Kansas City,
 Mo.: Aller Todd, 1224 Union Ave. . . . Cincinnati: J. E. McLaughlin, 401 Lock St. . . .
 San Francisco: Owens-Illinois Pacific Coast Co.

Maryland

BOTTLES
AND JARS





Getting the most out

A large manufacturer of packaged goods came to IPI recently with this problem. "Our printing," he said, "is done in several cities. We use patent and clay coated cartons, corrugated containers, glassine and label stocks. The inks must be resistant to certain chemicals present in our products. How can we give accurate color specifications to our various printers so that every one of our packages and containers will have *exactly* the same color, *exactly* the same resistance?"

"The thing to do," we replied, "is to make an IPI Color Standards Survey. Let IPI work with your printers. They will give us a list of the papers and boards you use and the colors you want on them. They can tell us, in each case, the printing process that will be used and the resistance tests which the inks must pass. We will then formulate the correct ink for each job. And when we get the colors just the way you want them, we will supply color guides showing the right color on each type of stock—average coverage, darkest allowable tolerance and lightest allowable tolerance. Below each color sample we will print the formula number of the ink used.

"The correct formulas will be sent to each IPI branch throughout the country. Your printer may then order by formula number from the nearest



INTERNATIONAL

DIVISION OF INTERCHEMICAL CORPORATION,



of COLOR

IPI branch the inks for the particular package he has to print. Your printer will know that the inks are the right color and have the required characteristics." If your package printing problems are complicated by the need to maintain standards on various types of board and paper we may be able to help you solve them. Call the nearest IPI Branch.

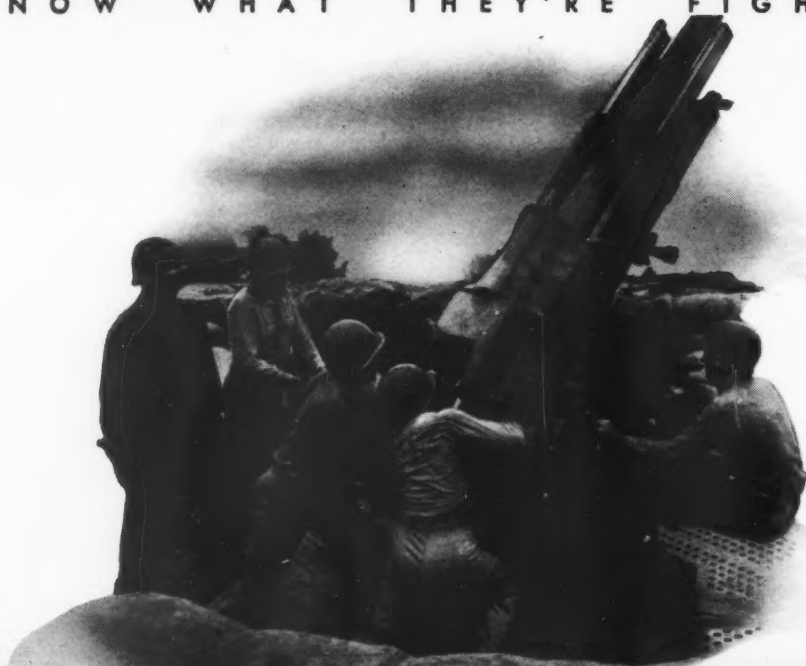
Leading package, bag, carton, container and label printers have long recognized International Printing Ink's technical skill and experience in the development of materials and methods for uniformity of color control, inks without odor, faster drying inks, non-bleeding wax-set inks and inks resistant to soap, moisture, mild alkalis, alcohol or food acids. This leadership is the direct result of our continuous program of color research and our use of precision control equipment—such as the General Electric Recording Spectrophotometer, Spectrograph, IC Viscometer, ICTackmeter, Electron Microscope and other equipment, some of it our own development—for the exact measurement and analysis of color and materials. IPI laboratory technicians and your IPI representatives are equipped to help you, too, find the answers. Keep in touch with IPI!

PRINTING INK

EMPIRE STATE BUILDING, NEW YORK CITY



THEY KNOW WHAT THEY'RE FIGHTING FOR*



"a man's a man -- regardless of race, color, or creed."

from the following letter written by Corporal Patrick D. Fisher, a Catholic

****"At this camp there is a former lawyer, S——, an Orthodox Jew and the finest man in the world. We pal around with men of every conceivable nationality and religion known. We are all very close and accept each man at his intrinsic value. **** S——, with his fine disposition, his tolerance, his good breeding and ingratiating smile has done much to combat bigotry and intolerance.

You will recall that in the army there are many who are raised with bigotry, but living with us they have learned tolerance and understanding for the other man's religion, nationality, and social standing. We are fighting for something worth preserving: democracy, tolerance and brotherhood, and we will fight to hell and back and then some more for a chance to return to a normal world where the Golden Rule is supreme and a man's a man—regardless of race, color, or creed."

(signed) Patrick D. Fisher

BONDS FOR LETTERS!
TWO \$25.00 WAR BONDS WILL BE
AWARDED EVERY MONTH FOR
EACH LETTER PUBLISHED.

Have you received a letter from a serviceman illustrating the spirit of cooperation and understanding which unifies America's fighting men of all faiths, races, backgrounds? If so, send it to Arrow Mfg. Co. You and the writer will each receive a \$25.00 War Bond if letter is accepted for publication. All letters will be returned.

*ONE OF A SERIES OF ACTUAL LETTERS FROM SERVICEMEN EXPRESSING THE DEMOCRATIC IDEAL—A POWERFUL WEAPON IN WAR, A PROMISE OF ENDURING PEACE FOR ALL MANKIND.

Arrow is proud that it is today the country's largest supplier of the boxes which hold the medals for the heroes in our Armed Forces.

Arrow
BOXES AND DISPLAYS



ARROW MANUFACTURING COMPANY, INC., FIFTEENTH AND HUDSON STREETS, HOBOKEN, NEW JERSEY

Have you seen the packaging Show at San Giovanezza?



Good packaging is one of the big reasons why America's fighting men are the best equipped in the world. On every war front, our soldiers learn what packaging science can do to make a perfect marriage between contents and container.

Some day, soon, these millions of men, accustomed to the best in packaging, are going to do their shopping at home, here in America. That's why it is important that manufacturers and converters get the complete overall picture of wartime packaging—and see how it applies to their civilian businesses.

It is important to see the bombardier's briefing case and the transparent paybook envelope (both made of Lumarith) turning into shop envelopes throughout all industry . . . the ordnance wrap turning into wrapping for air transport . . . to see Lumarith VN ordnance landing bags turning into new types of packaging . . . the Lumarith ammunition components turning back to transparent rigid containers for added values . . . the Lumarith windows in humidity indicators and large shipping boxes turning into both old and new window applications . . . the Lumarith-

backed pressure-sensitive tape on gas capes, waterproof packages and identification symbols expanded into a thousand peacetime uses . . . the molded Lumarith spare-parts boxes and First Aid Kits turning into an unending list of functional packages.

Get a preview of this reconversion at the Celanese display at the Packaging Show. At the booth you will also learn about another Celanese program that has brought all these data together for intensive study by you and your organization. We have news for you. Make the Celanese booth your first point of call or write us directly. Celanese Celluloid Corporation, *The First Name in Plastics*, a division of Celanese Corporation of America, 180 Madison Avenue, New York City 16.

TUNE IN
The Celanese* Hour—
"Great Moments
In Music"
Columbia Network,
Wednesdays, 10 P. M., E. W. 1.

Lumarith^{*} *a Celanese* Plastic*

FILMS • FOILS • SHEETS • MOLDING MATERIALS

FOR PACKAGING

^{*}Reg. U. S. Pat. Off.

MARCH • 1944

35

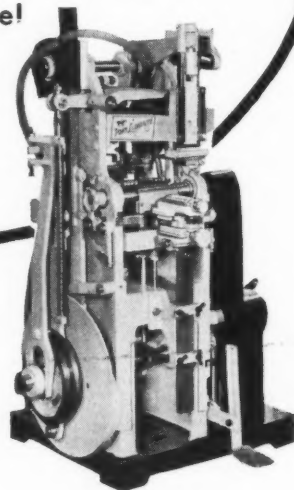


What can YOU do with a split second?

Shave half-a-second or half-a-minute from an operation, and you save half a day. In these days of manpower conservation it permits ONE employee to do the work of TWO! The urgent need of women in war plants NOW paves the way for action now which, in labeling or sealing of containers will reduce production cost of your product for years to come.

LABELRITES, hand-feed or fully automatic eliminate ALL handwork except for one machine attendant. That means vital split-second savings in personnel and time!

IF the product you label does not rate a War-priority, establish a Post-War priority by ordering Labelrites NOW!



NEW JERSEY MACHINE CORPORATION

1600 Willow Avenue . . . Hoboken, N. J.

Chicago Office: 325 W. Huron Street



LOOKING TO THE *Future*

is now called "Post-War Planning". And post-war planning can be just plain wishful thinking, or it can be an honest study of the developments which, accelerated under a war economy, will unquestionably influence post-war methods and markets.

The critical shortage of various pre-war packaging materials gave the paper bag an opportunity to "take over" in many new fields. Thus, as a substitute, it made early contribution to the war effort.

But these new fields called for refinements and improvements out of which has emerged a variety of paper containers hardly recognizable as members of the paper bag family. In terms of attractive appearance, durability and economy, these war-born paper containers have already demonstrated in practical use their right to permanent consideration.

Your own post-war plans will do well to include a survey of the most recent developments in pre-formed paper containers.



UNION BAG & PAPER CORPORATION
WOOLWORTH BUILDING • NEW YORK CITY

PEANUT SLAB • BLOMMER • TANGO • WALNUT CRUST • KING FISHER • PAY DAY • BIG TOM • FIFTH AVENUE • PEAKS •
 CHERRIE • QUEEN ANNE • DENY • SANDWICH • BIG BOZO • CREAM FILLED COOKIES • GIANT • RUM FRAPPE • MILK
 CHOCOLATE CUTS • CLARK • LOV • ST • SUNDAE • TREAT • POWER HOUSE • LUCY ELLEN CHOCOLATE ALMOND • PEANUT
 BUTTER SANDWICH • MASON'S QU • S • QUEEN HIGH • CHICKEN DINNER • BOMBER • MRS. HUBBELL'S OLD FASHIONED
 COOKIES • BONNIE FARE • PENU • SWING BAR • HOLLYWOOD • NUT CARAMEL • KING COLE PEANUT BAR • BIG CHIEF •
 LORNA DOONE • CHOCOLATE PECA • LL • OH HENRY! • HI-MAC BAR • YANKEE DOODLE • TOOTSIE ROLL • COCOANUT •
 CHOCOLATE MILK SHAKE • MASON' • UTS • QUICK LUNCH • BUTTER NUT • WHOPPER PEANUT BAR • ACK ACK • MONDAE •
 FULL DINNER • YUSAY • BROADWA • ORIENTAL COCOANUT BARS • FINE FUDGE BAR • BOLSTER • HOT FUDGE
 • FORTIES • ZAGNUT • VITA-DATE • VE NES • SPOT PECAN • PEANUT BUTTER LOG •
 KRUNCHIES • VITA SNAK • HOT SCO • DUTC • OLD FASHIONED PEANUT BAR • COLD
 TURKEY • SHORT BREAD • SEVEN • PAINTY • FLENGER • SKIPPER • KREEM
 MAID FUDGE • CLIPPER • BRAZIL • NUT FUDG • COATED GRAHAM
 • CHERRY MAS • HONEST SQUAR • LL • RODEO • SEM SWEET BARS • SWISS LUNCH
 • CHOCOLATE • N UP • CHEESE CRACKERS • NUT LUNCH • MAPLE
 PECAN BY LUCY ELLEN • SQUARES • CHERRY BOMB • 7-11 • OREO SAND-
 WICH • PLUM GOOD • BLOMMER • TANGO • WALNUT CRUSH • KING
 FISHER • PAY DAY • E • E • DENVER SANDWICH • BIG BOZO • CREAM
 FILLED COOKIES • GIANT • E • ST • SUNDAE • TREAT • POWER HOUSE
 • LUCY ELLEN CHOCOLATE ALMON • NS • QUEEN HIGH • CHICKEN DINNER •
 BOMBER • MRS. HUBBELL'S OLD • SWING BAR • HOLLYWOOD • NUT CARAMEL
 • KING COLE PEANUT BAR • E • ROLL • OH HENRY! • HI-MAC BAR • YANKEE
 DOODLE • TOOTSIE ROLL • C • MINUTS • QUICK LUNCH • BUTTER NUT • BRUNCH
 • WHOPPER PEANUT BAR • B • BROADWAY • ORIENTAL COCOANUT BARS • BOB CAT
 BIG BONUS • TWIN SMACKS • G • BIG TOM • FIFTH AVENUE • PEAKS • CHERRIE •

T

ODAY WRAP-O-MATIC WRAPS OVER 100 LEADING CANDY BARS, BISCUITS AND COOKIES

For HIGH SPEED PRODUCTION . . . SAVINGS IN WRAPPING MATERIAL . . . and SAVINGS IN LABOR are the reasons why leading confectionery manufacturers and bakers choose Wrap-O-Matic for wrapping candy bars, biscuits, cookies and many other small, soft or irregular shaped items.

Wrap-O-Matics are built in 2 basic models—Side-intake (illustrated) for feeding directly from enrober belt . . . straight-intake especially designed for 2 or 3 piece bars.

Wrap-O-Matic operates at high speed, (up to 120 units per minute) wrapping soft and irregular shaped bars and biscuits, and uses glassine, cellophane, foil or any type wrapper that can be printed in rolls. Economizes on materials and labor . . . savings up to 35% in wrapper costs and up to 75% in labor . . . two vital factors in today's material and manpower shortage.

Let us survey YOUR wrapping problem. Write today for illustrated brochure and details of how Wrap-O-Matic will increase your production, sales and profits.

LYNCH
WRAP-O-MATIC DIVISION

Manufacturing Corporation, Defiance, Ohio
U.S.A.

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POSTWAR PLANNING

... *For Packages*



Ohio
C.A.

Champion Kromekote*

*Kromekote is the registered trade-mark of The Champion Paper and Fibre Company's cast coated high finish paper.

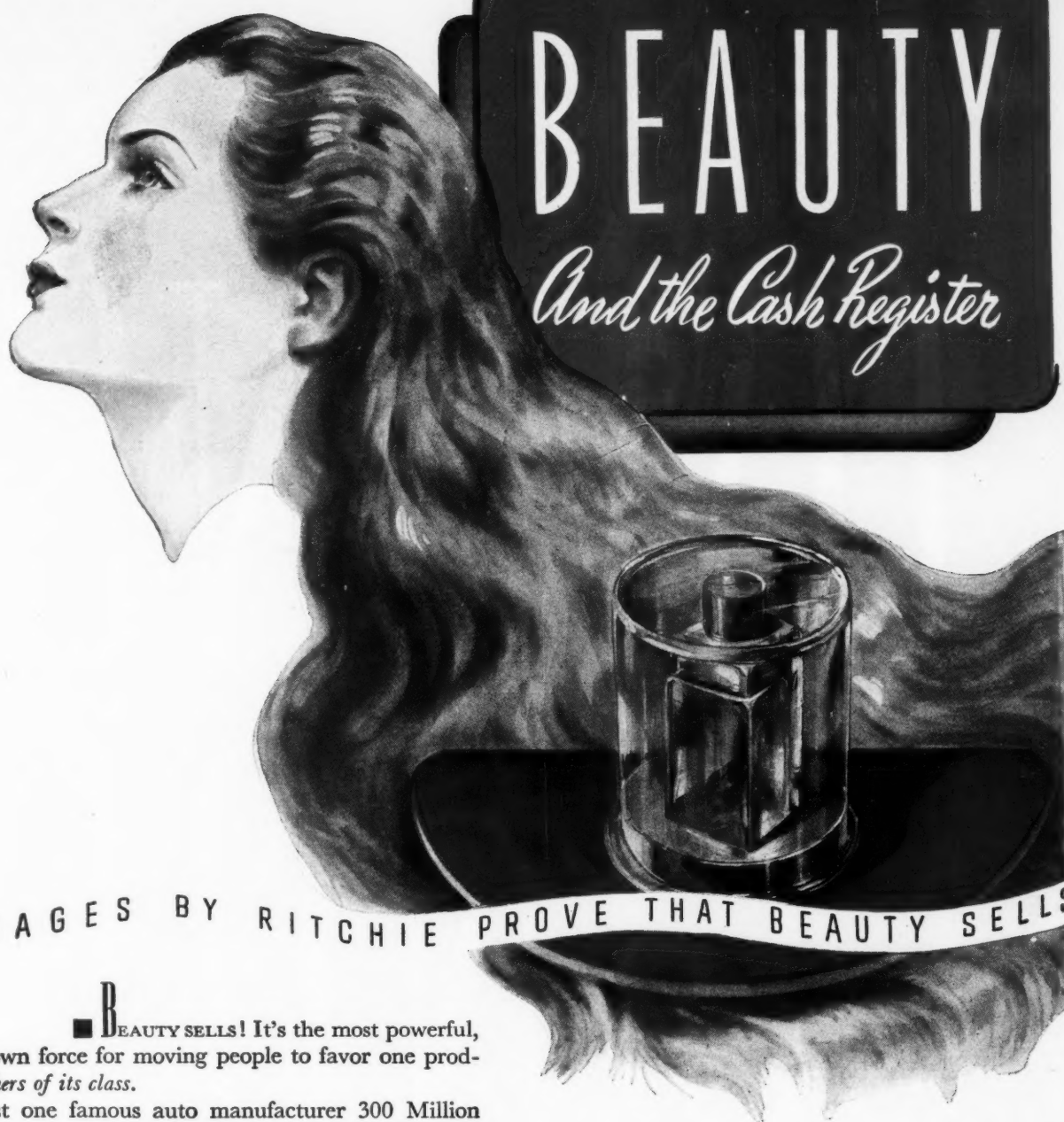
Beauty and Sales

with Champion Kromekote

The end of hostilities in Europe means a wild scramble to produce new goods and dress them up in competitive array before an exacting buying public with burning pockets. Old products, too, must be redesigned and redressed if they are to retain favor in a rapidly changing world. Now is the time to plan new packages and labels of Champion Kromekote, a beauty treatment for the finest goods, old and new, a rare and exclusive setting for your choice creations. War-time conditions for many months seriously have curtailed production of cast coated high finish Champion Kromekote, but full scale production will parallel that of your own operations and needs. This then is the time to obtain samples of Champion Kromekote and get ready with your new boxes, labels and wraps.

THE CHAMPION PAPER AND FIBRE COMPANY
HAMILTON, OHIO





PACKAGES BY RITCHIE PROVE THAT BEAUTY SELLS

■ **BEAUTY SELLS!** It's the most powerful, single, known force for moving people to favor one product over others of its class.

It cost one famous auto manufacturer 300 Million Dollars when he underestimated the public's love of beauty and a competitor did not. He had to scrap his old model, close his plants, call in designers, and produce a beautiful, colorful car to regain his market.

Beauty sells!

It influences peoples' choices in *everything*—from motor cars to mates. Without design, without gleaming metal and white enamel, who could sell a kitchen stove? Streamlined trains get the extra fares. Color—in kitchen and bathroom—sells plumbing fixtures, rents apartments, sells houses. In one year, the people purchase 900 Million Dollars worth of cut flowers, One Billion Four Hundred Million packages of cosmetics. They want beauty. Spend big money for it.

That's why beauty in *packaging* pays.

That's why, in every package by Ritchie, whether it contains a delicately scented powder, or parts for a steering wheel assembly—you will always find, in its lines, in its proportions, color or general design, a strong eye-pleasing quality—elements of beauty.

HOW TO GET A PACKAGE THAT SELLS

Let Ritchie design a package for you and it will have beauty *more than skin deep*. It will have the right material and structure for its job. It will be practical, convenient to use, easy to handle, to stock and display. It will proclaim your product-identity. And Ritchie's expanded, war-developed facilities for volume production assure its low cost. Let Ritchie demonstrate how *you* can get a better selling package. Write us today.

W. C.

Ritchie

AND COMPANY

8842 BALTIMORE AVENUE • CHICAGO 17

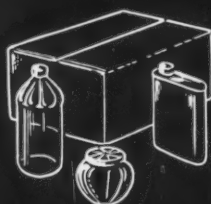
Set-Up Paper Boxes • Fibre Cans • Transparent Packages
NEW YORK • DETROIT • LOS ANGELES • ST. LOUIS • MINNEAPOLIS

A COMPLETE PACKAGING SERVICE... *Glass • Metal • Plastic • Shipping Cartons*

OWENS ILLINOIS

TOLEDO, OHIO

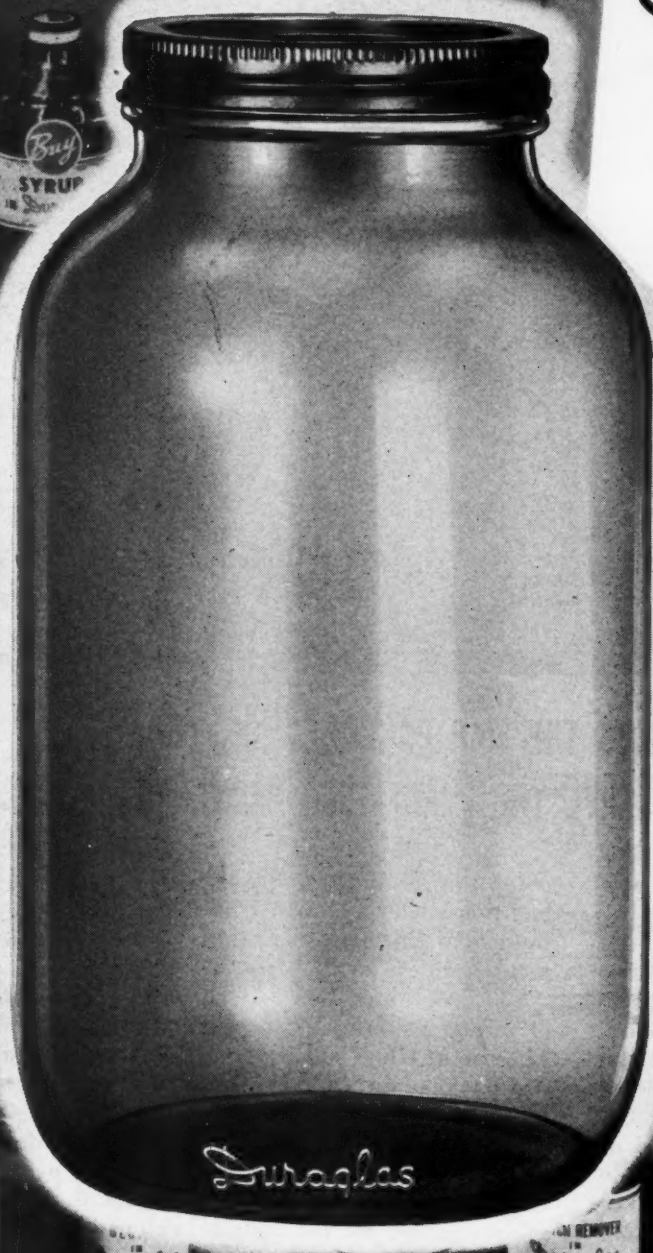
A BROAD TECHNICAL SERVICE... *Research • Design • Production • Merchandising*

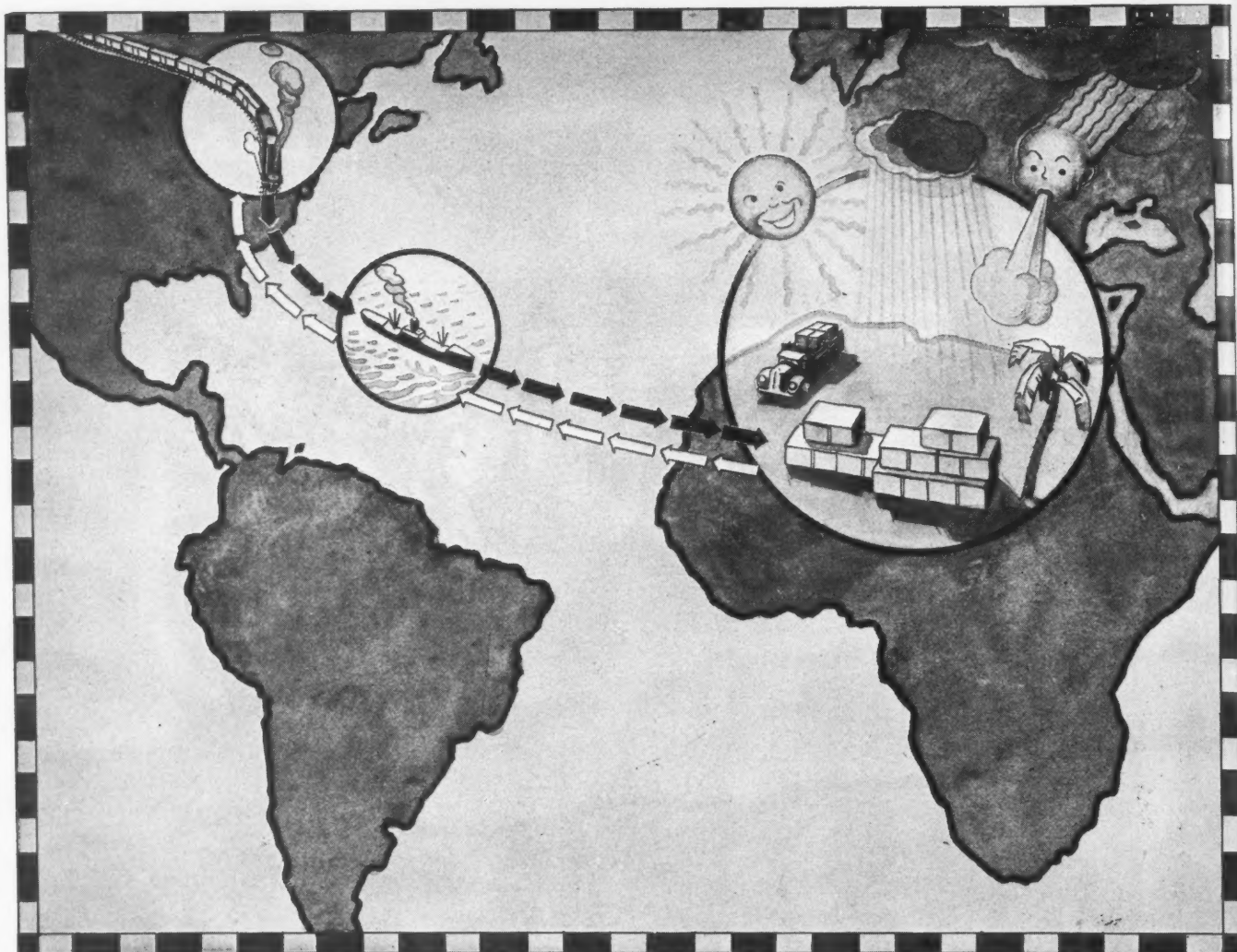


Carton

Duraglas
TRADE MARK REG. U. S. PAT. OFF.
Containers
*Give a Lift
to Living*

Advertising





GLU-WELD PROTECTS THE WAR PACKAGES OF TODAY— WILL SERVE THE PEACE-TIME PACKAGES OF TOMORROW

The following statement by a spokesman of a U. S. Government arsenal speaks for itself:

"We recently had returned to us from the African theater a shipment of materiel that we had sent across some time ago. All of this materiel had been packaged in our Field Service Warehouse. Examination of the packaging of the materiel showed that despite the rough handling involved in shipment by rail to a port of embarkation; shipment by sea; the carrying inland of the containers by truck; and despite the extreme weather conditions to which the packages were submitted in outdoor storage, as well as the same

conditions upon the return trip, the waterproof bag liners whose closures had been effected with the use of this Glu-Weld adhesive were in perfect condition."

Glu-Weld does not make a perfect package out of a poorly designed or assembled container. The use of Glu-Weld will however make a superior package out of a good one. In the above case the care and designing and assembling of the package gave it the structural strength necessary to complete its hard journey. The use of proven waterproof papers and Glu-Weld gave the package protection for the materiel shipped overseas.

Write today for full information about GLU-WELD

IN THE MIDWEST

The F. G. Findley Company

1230 NO. 10th STREET • MILWAUKEE 5, WIS.

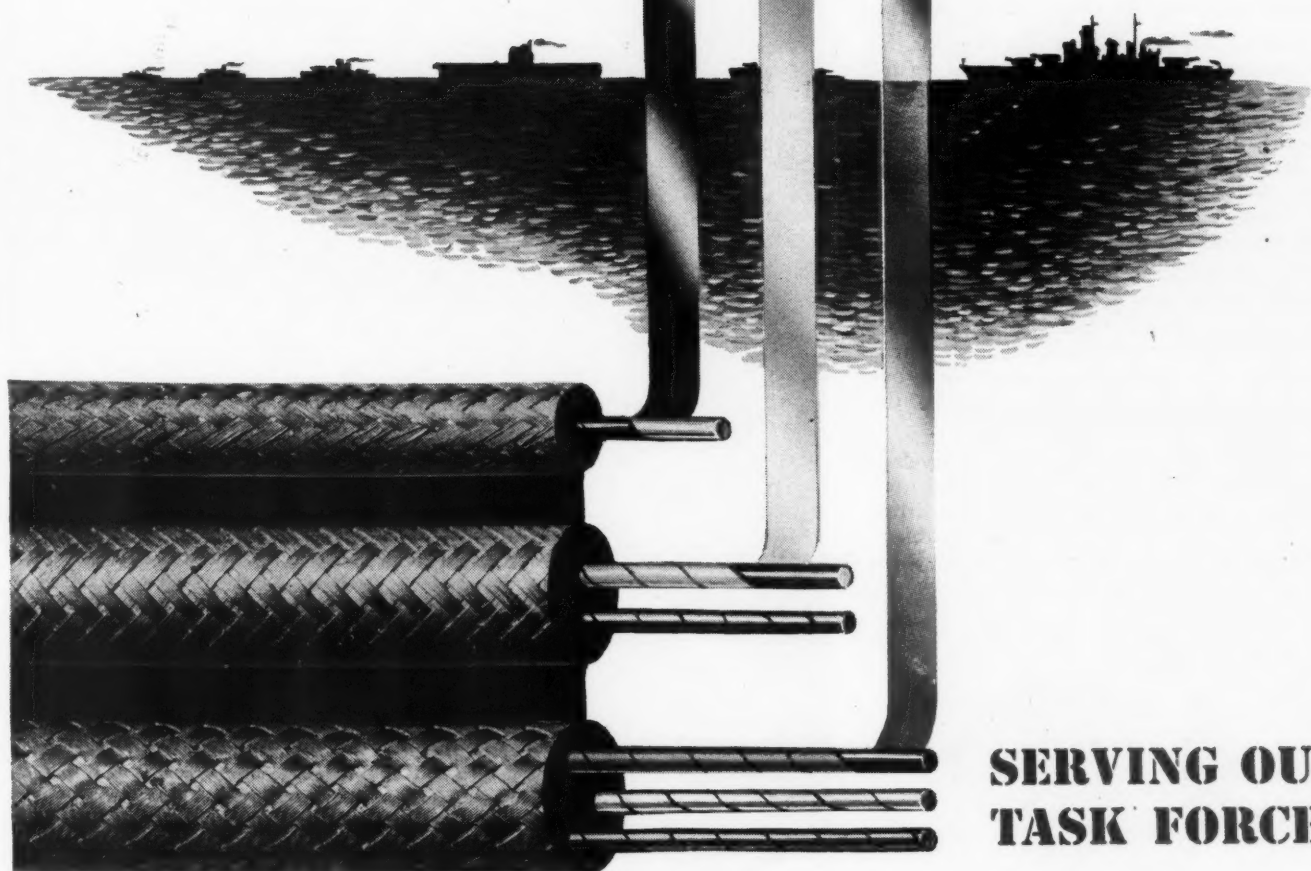


IN THE EAST

Union Paste Company

1605 HYDE PARK AVENUE • HYDE PARK, 36 MASS.

Sylvania Cellophane*



SERVING OUR TASK FORCES

Part of the production of Sylvania* cellophane is at sea, on fighting ships, as an important element in the structural formation of special electric cables. ★ The application, here, is one of the many important industrial services now being performed by Sylvania* cellophane.



*Trade Mark Reg. U. S. Pat. Off.

SYLVANIA INDUSTRIAL CORPORATION

General Sales Office: 122 East 42nd Street, New York 17, N. Y.

Works and Principal Office: Fredericksburg, Virginia



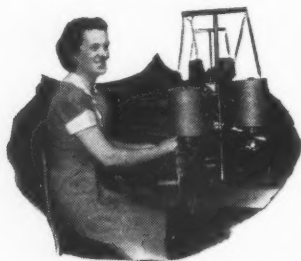
Bags Capture Hitler's Helper

From the cloud-smothered Arctic to the seething tropics, Hitler's helper, moisture, seeks to corrode and damage war machines and equipment from the Arsenal of Democracy. But the ingenuity that created American industry has found a way to capture this saboteur...in a bag.

In packing airplane motors for overseas, for example, small cotton bags of silica gel are tied on the motor. Then the whole assembly is sealed in a moisture-vapor proof covering and placed in its shipping case. The bags of silica gel draw dampness from air enclosed with the motor while the covering prevents more moisture from entering. The motor reaches the front rust-free and ready for battle.

Our contribution to this wartime packaging triumph, which also saves thousands of man hours at both factory and front, is the little bag that holds the silica gel. And while it is one of the smallest bags ever turned out by our mass-production facilities, we are proud of the contribution it is making to victory.

In our service to war industry, we are developing new types of bags with scores of new uses. Many of these applications will serve peacetime commerce. If you have a packaging problem, present or future, we may be able to help solve it for you. Won't you let us try?



CONTRIBUTING TO VICTORY

Mrs. Estelle Oliver, one of 8000 employees in 23 Bemis factories, considers her work a real contribution to victory. She visions the bags she sews at Norfolk, carrying food and vital supplies to her brothers in both the Army and Navy...or thinks of the bags filled with sand protecting her kin in battle.



Bemis Bro. Bag Co.

GENERAL OFFICES: ST. LOUIS • 23 PLANTS THROUGHOUT THE COUNTRY



BUY MORE WAR BONDS



BONDERIZED Sheet Steel

THE NEW PACKAGING MATERIAL

While wartime shortages accelerated the widespread use of Bonderized Sheet Steel for cans, containers, and closures, it is proving so economical and efficient that it is assured a definite place in post-war industry.

Bonderized Sheet Steel comes from the mill, ready for its finishing coat of paint, enamel or lacquer. It may be formed, crimped, seamed and sheared, providing a thoroughly workable material for the manufacture of thousands of different types of metal containers.

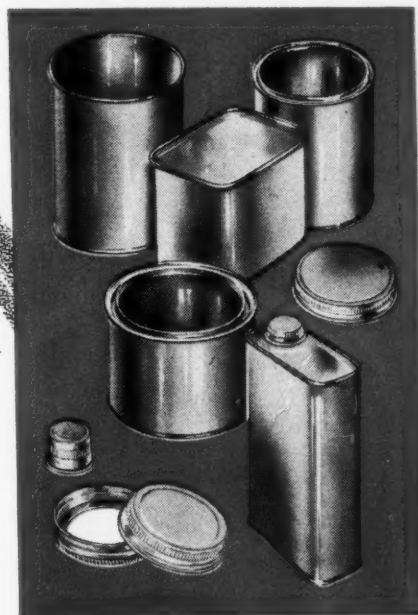
The Bonderite coating provides rust resistance, a cohesive base for organic finishes, and a fine surface for lithographed self decoration. Cans and containers made of Bonderized Sheet Steel have proven thoroughly practical for scores of products.

PARKER RUST PROOF COMPANY

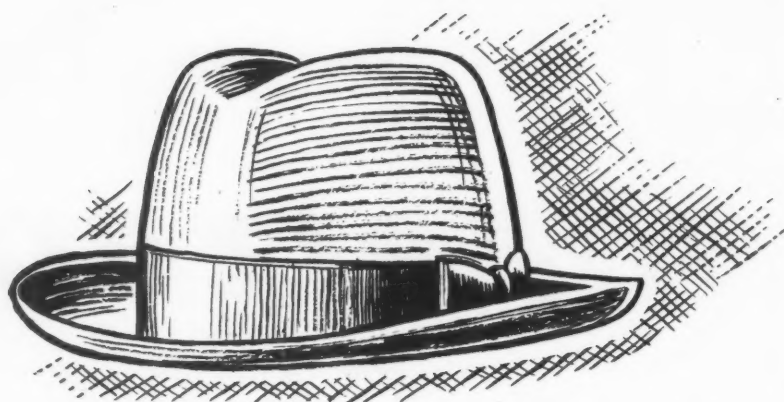
2187 E. MILWAUKEE AVE. • DETROIT 11, MICHIGAN

BONDERIZING • PARKERIZING • PARCO LUBRIZING
HOLDS PAINT TO STEEL PREVENTS RUST RETARDS WEAR

PARKER PRODUCTS CONQUER RUST



Bonderized Sheet Steel containers have fine appearance and are highly resistant to rust.



WE'RE KEEPING A LOT UNDER OUR HAT

for the time being

When we've finished with the job of working for victory, when peace has come and the restraint of patriotic discretion is lifted, we'll talk. We'll talk plenty — about accomplishments we're proud of, about new methods we're using, about technical means we've developed, about new products we've designed, products that we know will appeal to the discriminating buyers to whom we've always catered. We've got a lot to tell you — when it can be told.



THE PLASTICS DIVISION
COLT'S PATENT FIRE ARMS MFG. CO.
HARTFORD, CONNECTICUT

POST-WAR IMPRESSIONS

...in the making now

Booming business means more packages, more opportunities for your product or store to make its customers ambassadors of good-will to the general public. Lay the foundation now for a greater post-war demand in a competitive market by adopting



*Private
Design*

PACKAGING PAPERS

Your individually-created design on boxes, bags and wrapping paper becomes an easily-recognized symbol . . . building prestige and sales.

IDEAS...

WITHOUT OBLIGATION

Our experience serving America's leading manufacturers, wholesale and retail establishments will be helpful to you. Let our CREATIVE BUREAU submit suggestions in harmony with your merchandise and traditions. You will be surprised with the effectiveness and economy of our PRIVATE DESIGN PLAN. Write for information.

SPECIALISTS IN PRIVATE DESIGNS . . . PRINTED AND EMBOSSED

MATTHIAS PAPER CORPORATION 165 W. BERKS ST., PHILADELPHIA 22, PA.



Another

NEW DEVELOPMENT BY

STOKES & SMITH CO.

"FIN-SEAL TRANSWRAP" PACKAGE

This is one of the later developments of the Stokes and Smith Transwrap Packaging Machine, today needed by the armed forces, but with wide possibilities for post-war use. These packages are made of heat-sealing films such as Foil, Laminated Papers, etc. which heat-seal on one side.

On the Transwrap Machine with the "Fin Seal" attachment the heat sealing surfaces of two rolls of film are brought face to face, filled, sealed around all four edges and cut to make individual packages having a high degree of moisture-proofness. Where printed film is used, the printing may be registered by using a photo-electric mechanism or continuous printing can be used and cut at random.

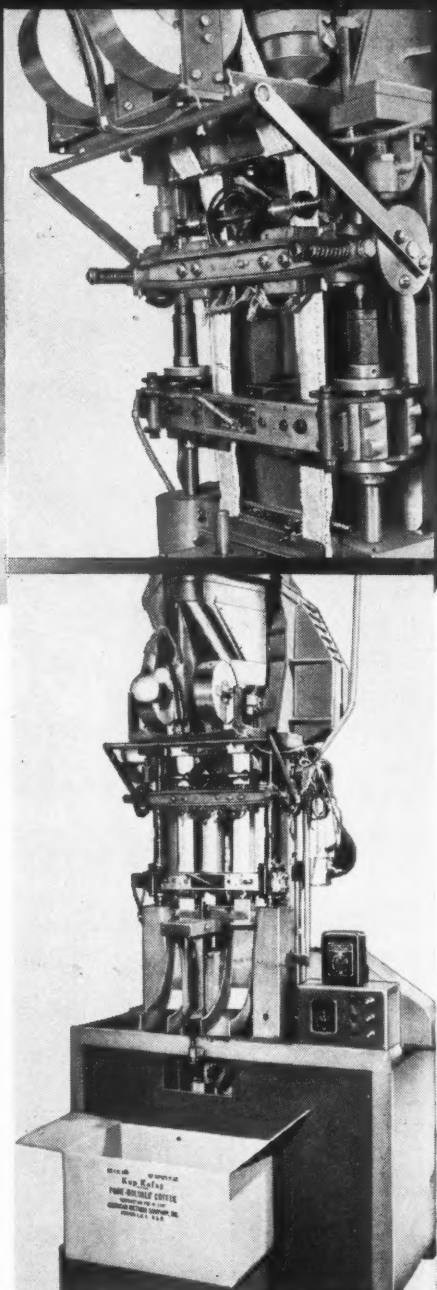
Various types of feeds can be furnished, depending upon the product to be packaged.

Send us samples of your product or package . . . we'll gladly give you complete information about the "Transwrap" or other S & S Filling, Packaging and Wrapping Machines.

STOKES & SMITH CO.

FRANKFORD, PHILADELPHIA 24, PENNA.

"Better machines for better packages"





Those gaps in your production line cost money.
They should be filled with paying occupants.

Your cartons are not merely so much converted
paperboard at so much per thousand. Accurate,
uniform cartons hold the answer to the smooth,
uninterrupted operation of your filling
equipment.

Consider your *total* packaging cost — from re-
ceiving platform to finished goods inventory.

We offer you our many years of experience in
the manufacture of precision packages.

THE OHIO BOXBOARD CO.

RITTMAN, OHIO

Manufacturers of Paperboard, Folding Cartons, Corrugated and Fibre Shipping Containers

SALES OFFICES: RITTMAN • CLEVELAND • PITTSBURGH • NEW YORK • CHICAGO





SUTHERLAND'S storehouse of packaging ideas is ready to help you find your best post-war package! Never before in the history of package goods merchandising has there been such a timely opportunity to break with old packages and introduce brilliant new ones. Many old designs are already war casualties . . . and post-war customers will be in a mood for *NEW* products, and *OLD* products presented in *NEW* ways.

Twenty-five years of packaging experience at Sutherland is today backed by one of the most modern package production plants in the world. Here, paperboard can be paraffined, laminated, or combined with other materials for proper product protection, and it can be attractively printed for eye appeal, for quick and lasting identification. Moreover, it can be fabricated into many sizes and shapes . . . rectangular, conical, cylindrical, and wedge-shaped.

Right now, the urgency of war packaging prevents us from making new commitments, but we are ready to start planning your post-war package today.

Drop us a line and put our package design experts and artists to work for your product, so you'll be a jump ahead of the field when current restrictions are lifted

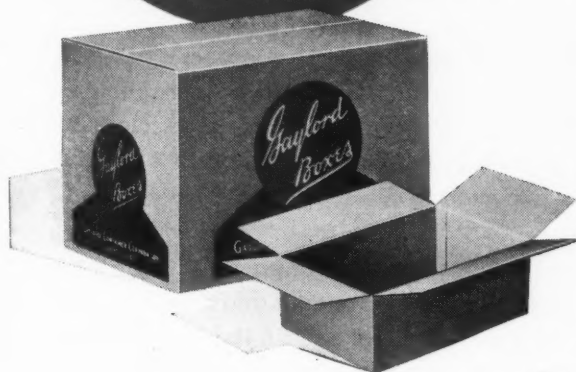
SUTHERLAND PAPER COMPANY

KALAMAZOO 13D, MICHIGAN



Photo U. S. Signal Corps

**To Speed Delivery and
Assure Protection —**



*You can play a vital part
— Buy More War Bonds!*

Munitions and Supplies Go to War in GAYLORD CONTAINERS

Packaging problems of today's global war presented many new demands to Gaylord's packaging specialists. From the designing of special shock-proof cartons used in dropping munitions from airplanes to the production of food containers which withstand surf-borne landings and tropical moisture — Gaylord is playing a vital part in protecting and speeding delivery of war materiel.

GAYLORD CONTAINER CORPORATION, General Offices: SAINT LOUIS

CORRUGATED AND SOLID FIBRE BOXES

FOLDING CARTONS... KRAFT GROCERY BAGS AND SACKS... KRAFT PAPER AND SPECIALTIES

New York • Chicago • San Francisco • Atlanta • New Orleans • Jersey City • Seattle • Indianapolis
Houston • Los Angeles • Oakland • Minneapolis • Dallas • Jacksonville • Columbus • Tampa
Fort Worth • Detroit • Cincinnati • Des Moines • Oklahoma City • Portland • Greenville
San Antonio • Memphis • Kansas City • Milwaukee • Bogalusa • Weslaco • Greensboro

Heavy firing reported on the **PAPER** front!



That artilleryman is stuffing paper leaflets into a shell. Presently there will be a weak explosion behind the enemy lines. Result — a shower of printed propaganda — probably "surrender tickets," entitling holders to good food and safety in the allied lines.

Tons of paper leaflets, news items, photographs — millions of tiny booklets and miniature newspapers — are dropped day and night on enemy and occupied territory.

Paper does the entire job. Radios are jammed, news channels blocked. Paper alone gets the morale-weakening truth to enemy fighters, gets the morale-building news to occupied lands.

But this is only a fraction of what paper is doing to win the war.

"See if it can be made of pulp or paper," is the order that goes out in a manufacturing pinch.

Very often, it can. Paper is even used at some bases for water mains. Waterproof paper holsters for rifles, paper camouflage, paper clothing for flyers — paper is doing hundreds of jobs it never expected to do, and doing them well.

Making a thousand miles of paper a day, as we do, we see new uses for paper and pulp developing every day. We feel certain that in the future paper will not only hold most of its gains, but will create new work for itself in fresh fields of peacetime industry.

Lets All Back the Attack with War Bonds



OXFORD PAPER COMPANY

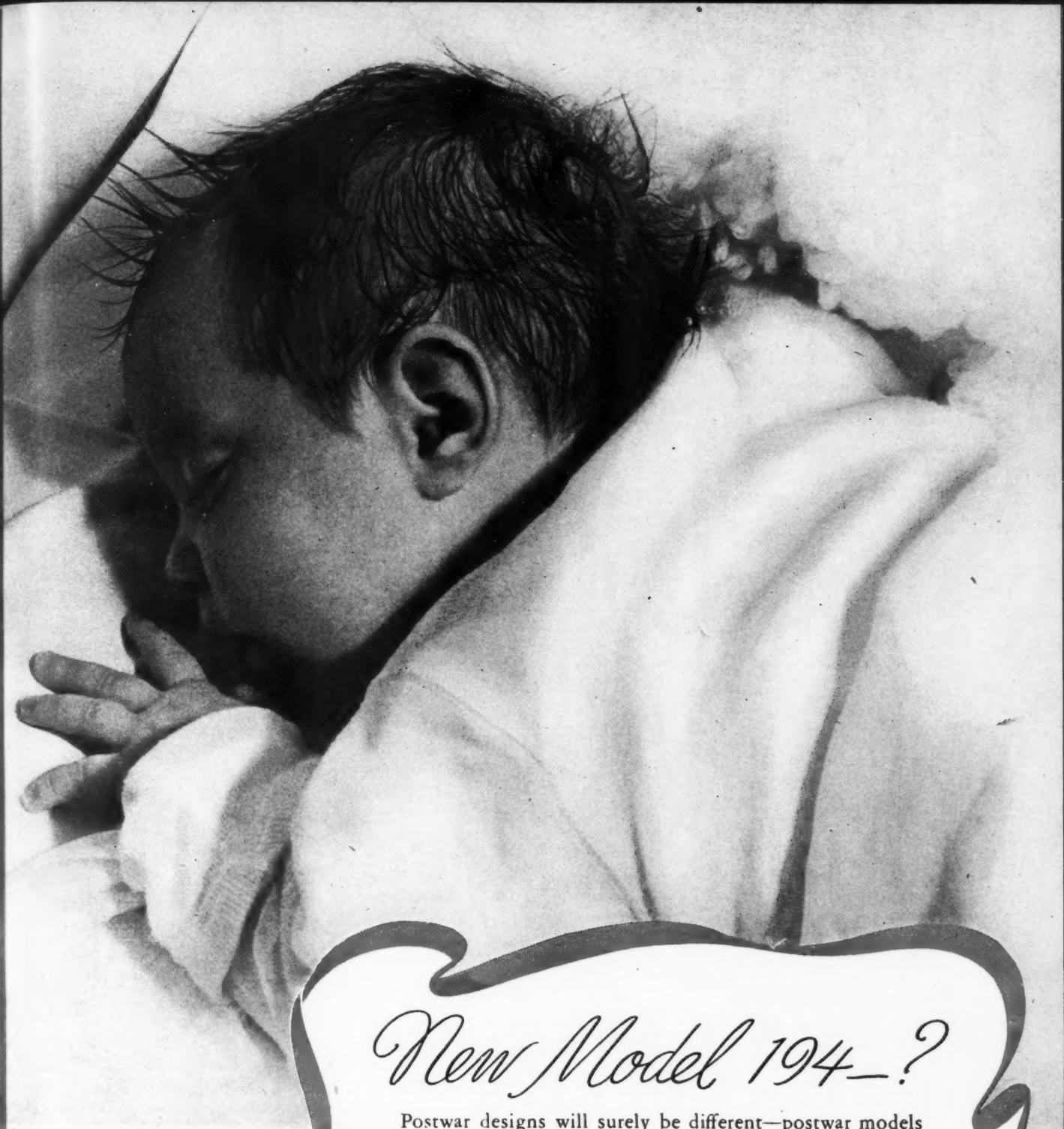
230 Park Avenue, New York 17, N. Y.

Mills at Rumford, Maine & West Carrollton, Ohio

Western Sales Office: 35 E. Wacker Drive, Chicago 1, Illinois



nt!



New Model 194—?

Postwar designs will surely be different—postwar models efficient and beautiful.

But our own research indicates that babies will come about in pretty much the usual way and their physical makeup will remain substantially the same.

Since our fight for a better world is really for these new citizens, it is our first duty to keep them well and strong.

That's where you play a big part, Mr. Packer. It's no news to you that food distribution will be a postwar problem; that if new products and new package designs will hold up production, new products—new packages—must wait.

Hazel-Atlas will continue to manufacture lightweight standardized containers until the production and distribution of food is again a competitive problem.

HAZEL-ATLAS GLASS CO.

Wheeling, W. Va.

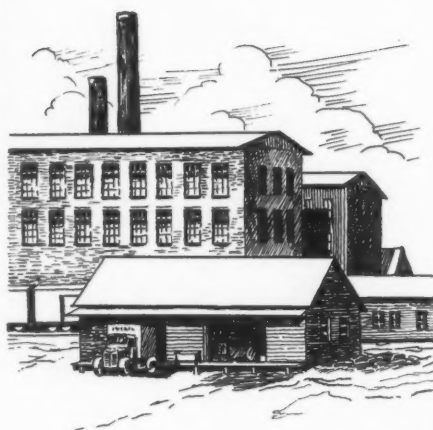


HERE IS WHY YOU NEED TO SAVE YOUR PAPER WASTE



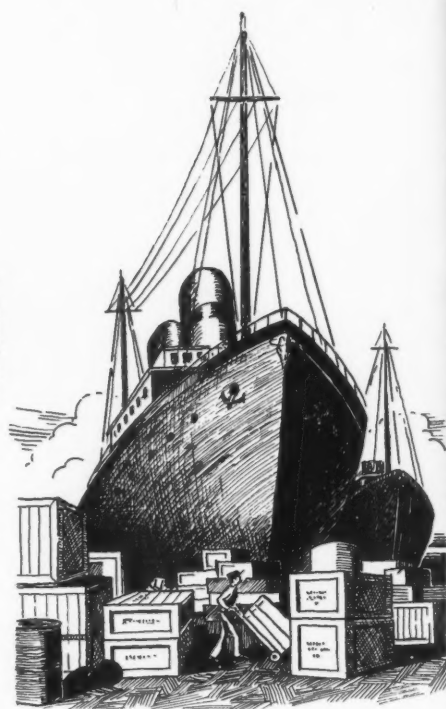
WOOD

is desperately needed for vital war materials. The lack of lumberjacks increasingly affects the supply of virgin pulp for the paper industry.



MANY MILLS

are slowing up because they are using waste paper at a larger rate than present collections.



SHIPMENTS

of rations, blood plasma, medicines, bullets and many other necessities are sent to the fighting fronts in paper containers.

YOUR PAPER WASTE

**WILL PACK A WAR PUNCH
WHEN IT GETS BACK TO
THE PAPER MANUFACTURER**

**OUR RELATION WITH THE PAPER INDUSTRY AND ITS DEVELOPMENTS URGES
US TO APPEAL TO YOU FOR GREATER EFFORTS IN SALVAGING WASTE PAPER**

CONSERVE TO SERVE



Fitchburg Paper Company

250 PARK AVENUE, NEW YORK CITY Mills: FITCHBURG, MASSACHUSETTS 11 SOUTH LASALLE STREET, CHICAGO



MUFFINS CAN BE GOOD! ON CARTONS TOO!



When it comes to capturing the appetite appeal of luscious golden brown muffins—or any food serving for that matter—"U-S" EYE-PETIZED cartons are in a class by themselves. Yes, the delicious goodness of attractive food servings can be portrayed on your package. And, "U-S" skilled craftsmanship can do full justice to the most colorful and tempting dish.

EYE-PETIZED: Eye Appeal plus Appetite Appeal

CARTONS ARE DESIGNED TO WIN CONSUMER PREFERENCE

Never has it been so important to package your product in a carton with consumer appeal. "U-S" cartons are winning consumer preference for many products—food, drugs, cosmetics, tobacco to name only a few. They are functionally designed to do a thorough merchandising job at the point-of-sale and at the point-of-use. Make sure your package is doing this important job for your product. Call in an experienced "U-S" representative to talk over your packaging plans—present and post-war. There's a "U-S" representative near you.

THE UNITED STATES PRINTING AND LITHOGRAPH COMPANY
Sales Offices in Principal Cities
HOME OFFICE: 360 BEECH STREET, CINCINNATI 12, OHIO.



5 Great "U-S" Plants . . . STRATEGICALLY LOCATED . . .

PRODUCING PACKAGING AND LITHOGRAPHED ADVERTISING OF HIGHEST QUALITY

BALTIMORE



BROOKLYN



CINCINNATI



ERIE, PA.



ST. CHARLES, IL



WHEN JOHNNY COMES MARCHING HOME

It'll be a Great-Day... The greatest in history...
The day the war ends and our Johnnies come marching
home. A day our boys fight for. The day we all
work for. And it will, we hope, start a new
world a spinning in which our Johnnies will never
have to march away again. Us oldsters have
another obligation to our Johnnies. To help
them win that new world... to give our boys jobs
with futures... to make work (with honest pay) for
all. We're doing our best to help speed the
Great-Day... and to make it stick.

Richard M. Krause
INCORPORATED

DESIGNERS • ENGRAVERS • PRINTERS • EMBOSSERS
OF FINE LABELS • SEALS • DISPLAYS AND FANCY BOX WRAPS

54 EAST 19th ST., NEW YORK 3, N.Y. • ALGONQUIN 4-6760

*An effective method
of product protection*

FOR WARTIME AND POSTWAR PACKAGES

Sealing in the original freshness and flavor of fine candy is an important job for CEL-O-SEAL cellulose bands at any time.

Today, "Satinets," a product of the Anderson Candy Co., are packed in glass jars with a metal-saving closure of waxed cardboard sealed securely in place by CEL-O-SEAL bands.

Today and tomorrow, CEL-O-SEAL bands will hold all types of jar and bottle closures tightly in place.

CEL-O-SEAL bands discourage meddling with the closure and forestall sampling the contents. The bands are supplied in colors that add distinction to the container. Impregnated with monogram, slogan or trade mark, they serve as a second label which adds sales appeal to the package.

Keep CEL-O-SEAL bands well in mind. They offer you a modern method of product protection at any time . . . now and for new re-designed packages after victory is won. Write for complete information.

CEL-O-SEAL bands are sold by:

E. I. du Pont de Nemours & Co. (Inc.),
"Cel-O-Seal" Section, Empire State Bldg., New York City 1

Armstrong Cork Company
Glass & Closure Div., Lancaster, Pa.

I. F. Schnier Company
683 Bryant Street, San Francisco 7, Calif.



DU PONT
CEL-O-SEAL
TRADE MARK
BANDS



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

SEAL ALL SIZE CARTONS

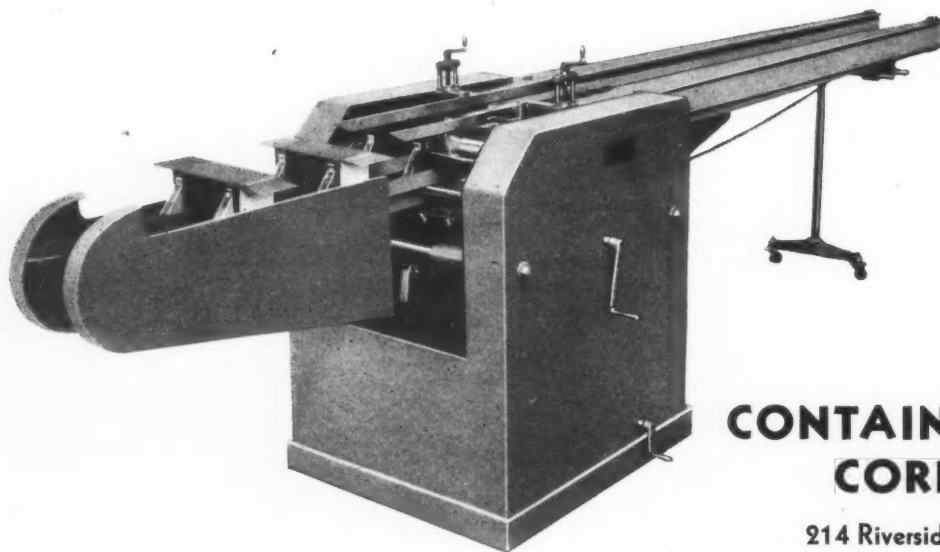
With ONE Low-cost Machine



Adjustable Carton Sealer

Features:—

- Eliminates sealing cartons by hand.
- Adjustable instantly without tools, for any carton 1" to 12" deep. Also available for cartons up to 65" deep.
- Seals both ends simultaneously.
- Glues both sides of middle flaps, laminating all flaps for maximum strength.
- Automatically squares-up ends of cartons.
- Fully portable. Entire machine mounted on casters, ready to plug in any electric outlet.
- Adjustable speeds up to 120 cartons per minute.
- Reduced sealing costs should liquidate your low initial investment during first year of operation of this flexible equipment.
- Send for details.

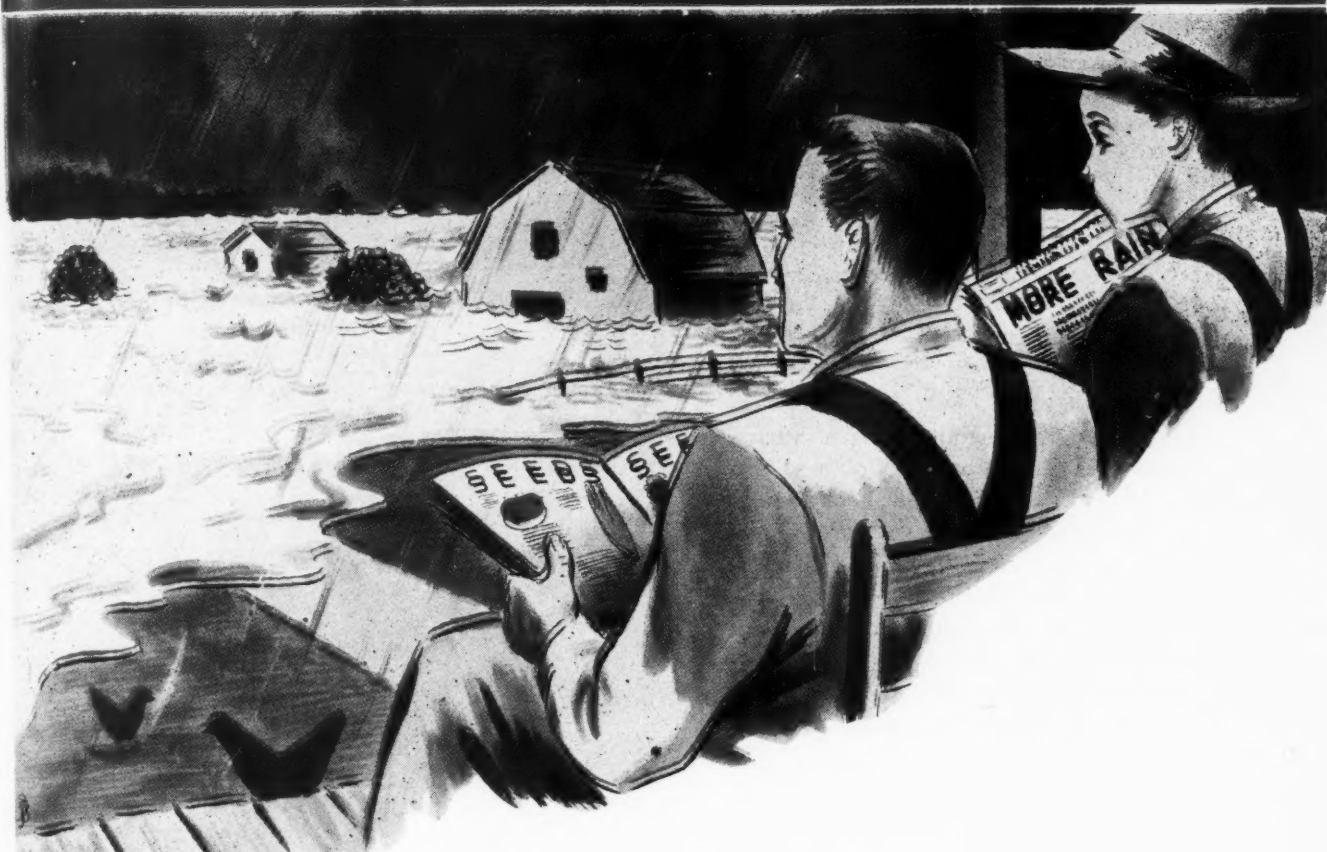


CARTON SEALER
MODEL 3901-12

**CONTAINER EQUIPMENT
CORPORATION**

214 Riverside Ave., Newark 4, N. J.

Planning TOMORROW'S WORK



This farmer is calmly planning his crops, despite the flood, because he knows that the waters will recede in due time.

Likewise, farsighted business men are planning for the time when the present flood of war orders will recede.

OLD DOMINION'S creative and engineering staff is already working on new and exciting packages for some of its farsighted clients. OLD DOMINION is ready — now — to redesign YOUR packages to meet the stiff competition of tomorrow.



OLD DOMINION BOX COMPANY

CHARLOTTE, NORTH CAROLINA
PLANTS IN NINE SOUTHERN CITIES

Folding Cartons • Set-Up Boxes • Convolute • Spiral Wound and Corrugated Containers
"THE SOUTHERN BOXMAKER WITH A NATIONAL REPUTATION"

Ever think what a SINGLE-USE CONTAINER can do for your Post-War Product?

WILL your post-war package be convenient to use? Will it protect your product—boost your profits and sales? The answer is "Yes,"—if your package is the single-use container—The Sun Tube Unitainer.

For such big-sellers as G. Washington Coffee, Mistol, Bromo-Seltzer, Vitalis and Sal Hepatica have proved by actual sales results that the Unitainer is a merchandising method that sells—sells, because people like its convenience and cleanliness and protection.

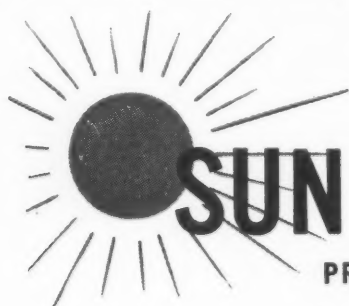
Yes, these famous items have shown that many a product now using a multiple-use package, can increase its sales by changing to the single-use container.

What about yours? If you package drugs, foods, toiletries or household items—the Unitainer may supply just the sales boost your product needs.

Right now, we are making UNITAINERS for war purposes but we'll be glad to tell you about them—to explain what they can do for your post-war product. Just call or write our nearest office.

10 Reasons Why You Should Include Unitainers In Your Post-War Planning

1. Hold individual, measured amount.
2. Assure against substitution and "counterfeiting."
3. Quickly opened, require no separate opener.
4. Hermetically sealed and non-refillable.
5. Protect against light and heat.
6. Reduce loss due to leaks and breakage.
7. Smart and attractive in appearance.
8. Reach the consumer in the original container.
9. Handy to use and completely sanitary.
10. Offer excellent means for sampling.



SUN TUBE UNITAINER

PRODUCT OF SUN TUBE CORPORATION • HILLSIDE, N. J.

CHICAGO, ILL.
James L. Coffield, Jr.
360 No. Michigan Avenue

ST. LOUIS, MO.
M. P. Yates
315 Chestnut St. (Room 125)

ST. PAUL, MINN.
Alexander Seymour
903 Pioneer Building

LOS ANGELES, CALIF.
R. G. F. Byington
1260 North Western Ave.

UNITAINER revolutionizes paint merchandising

By putting pigment colors in Unitainers, The Murphy Varnish Co. enabled dealers to carry white paint to which pigment could be added instead of a large variety of pigmented colors and tints. This reduced dealers' stock-keeping, gave Murphy an edge on competition.





ADVERTISEMENT NO. 2 OF A SERIES
DEMONSTRATING THE DIVERSIFIED
RANGE OF PACKAGING MATERIALS
USED BY MENASHA TO RENDER A

Complete Packaging Service

Menasha END SEALS

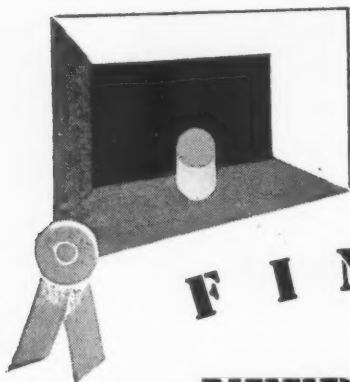


End Seals are printed thermoplastic labels, automatically applied as bread packages go through the bread wrapping machine. They have demonstrated these advantages: (1) Excellent point-of-sale brand identification and merchandising aid; (2) Dependable, firm end closures which make every package saleable; (3) Reduced wrapping costs effected by saving of wrapping material and faster machine wrapping operation. This Menasha development resulted from long experience with, and thorough study of, bakery packaging problems. The same "know-how" is available for practical and technical study of packaging puzzles confronting other industries.

THE MENASHA PRODUCTS CO. - MENASHA, WIS.

Division of Marathon Paper Mills Company





FINE PACKAGES NEED

EXTRA SHIPPING PROTECTION

"On-to-Sta" gummed tapes not only seal shipments much more quickly—but they seal them securely, giving the additional protection that fine packages need.

In our complete line
of gummed tapes is one
to suit your purpose:

- GUMMED SEALING TAPE, PLAIN & PRINTED ★
- "CARPAC" REINFORCED SEALING TAPE ★
- HEAVY GUMMED KRAFT ★
- GUMMED CAMBRICS ★
- "INERWOV SOLSEAL" REINFORCED
WATERPROOF TAPE ★
- ASPHALT LAMINATED REINFORCED WATER-
PROOF WRAPPING PAPER ★
- CREASED GUMMED STAY ★
- GUMMED HOLLANDS ★
- COMBINING ★

If you tell us your problem,
we will send you samples
of the proper sealing tape.

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MANUFACTURERS OF "On-to-Sta" GUMMED PAPERS

PLANT & MAIN OFFICE: ONE MAIN ST., BROOKLYN 1, N. Y.

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INTO *Action* IN KIMBLE CONTAINERS



These Kimble Serum Bottles and Vials are on their way to the fighting fronts — and to the home front — to carry vital health-giving products where they are most needed. They are representative of Kimble Glass Containers of

many types produced for essential purposes.

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For Assurance

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KIMBLE GLASS CONTAINERS CO., INC., NEW YORK, N. Y.
NEW YORK • CHICAGO • PHILADELPHIA • PITTSBURGH • ST. LOUIS • ST. PAUL • WASHINGTON, D. C.

HERE COMES ANOTHER 20,000,000

WAR WORKERS!

Right off the presses, ready to perform their duty dependably and unflinchingly; a function as important as the front line. For without these closures, necessary foods would perish, vital drugs become contaminated, strategic chemicals assume impotency.

Yet, the value of molded closures does not end merely with utility. Tons of precious metals are routed to the war effort by the elimination of metal from cap and closure applications.

In the post-war era, we'll talk about the beauty, finish and lustre, too, of MACK molded closures. How their high quality, excellence of design and low cost are prime requisites in civilian marketing; how they reduce sales resistance.

Right now, though, we want to emphasize the part played by MACK closures — millions of them—in helping to win this war. Inquiries should be addressed to Mack Molding Company, 132 Main Street, Wayne, New Jersey.



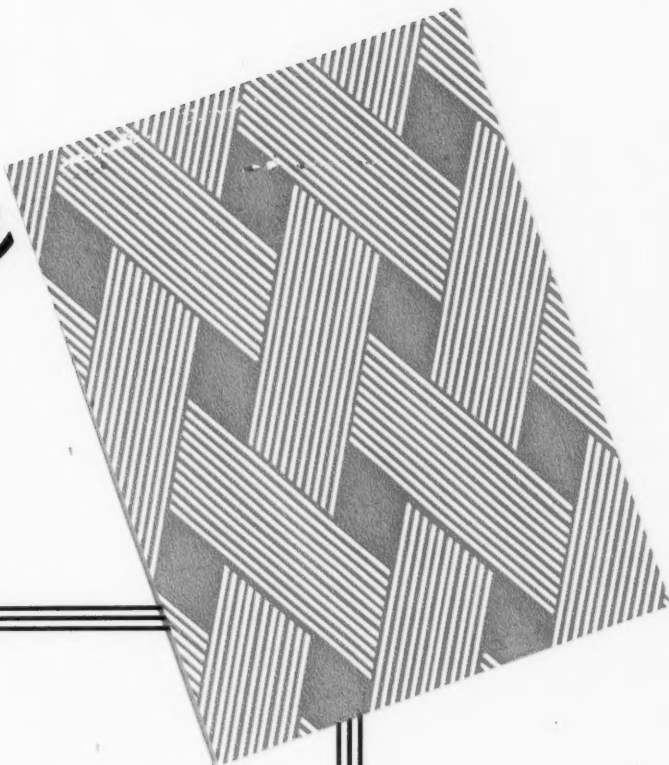
Mack
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SALES OFFICES: NEW YORK CITY, CHICAGO, DETROIT,



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A Tip on A Tip-On



We show you a sample of *one* of our papers to excite your eye and stimulate your imagination . . . just as this paper will react on the consumer of your packaged goods.

Of course, we can show only one—but it is representative of many patterns, colors and textures we are making from time to time (in limited quantities, of course).

Tell us your problem, or send your package—and we'll give you working samples to test and try out.

Hazen Paper Co.

HOLYOKE,

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HEAVY DUTY MULTIWALL PAPER BAGS

☐ Strong kraft multiwall bags made in Sewn and Pasted Open Mouth and Sewn and Pasted Valve styles. Designed and built to meet any hazard encountered by bulk shipping containers today.

☐ Our bags "in the Service" are living with history on numerous South Sea isles and on every Continent of the Globe — safely bringing their contents right where needed.

☐ Our long experience in solving the packaging problems of many industries is available to you.



MULTIWALL BAGS

INTERNATIONAL PAPER PRODUCTS DIVISION

International Paper Company
220 East 42nd Street, New York, N. Y.

Sales Representatives

BAGPAK, INCORPORATED

GEORGE & SHERRARD PAPER CO.

Include **CAPEM**

IN YOUR POST-WAR PLANS!

Post war packaging will benefit greatly from machines and methods developed to meet war-time needs. Right now alert manufacturers are evaluating these developments in relation to their own packaging problems.

CAPEM Screw Capping Machines, until now largely devoted to speeding the production of ammunition for war, are once more taking their place as leaders in the sealing of all types of bottles, jars and cans. Handling containers of any size or shape, CAPEM applies all types of screw caps automatically and at high speed.

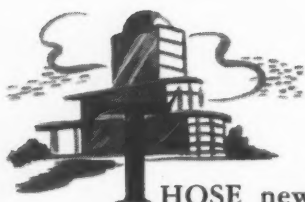
Its automatic features and great flexibility make it easy to fit CAPEM into any packaging line. It eliminates inspection yet guarantees a leak-proof seal. And the installation of CAPEM invariably results in increased production and important savings in labor cost.

For any container sealed with a rotary motion, CAPEM is the ideal capping machine. Let a Consolidated representative show you how it will speed up your production.



CONSOLIDATED PACKAGING MACHINERY CORP.
BUFFALO, N. Y.

Will Your DISPLAYS Be Ready?



HOSE new post-war products will catch the eye of the buyer quicker and sell faster when featured in Regent Counter and Floor Displays. Although Regent is now producing war materials, its Research and Designing Department is eyeing the future.

Regent is planning sales-appealing displays for jewelry, cosmetics, silverware, leather goods, men's wear, cutlery, hardware, pharmaceuticals, cameras, films and novelties of all kinds.

Basically built of wood, these silent salesmen will be made doubly effective by the use of color, new metals, plastic and glass.



Our MEN ARE READY

to call on you. But conditions suggest discussion of designs for new displays by mail first.



But... IF A LETTER WILL DO..

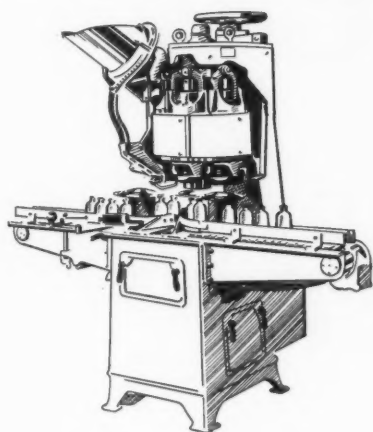
send full description with sketch, photograph or blueprint of product, its container, its colors and size.

Regent DISPLAYS

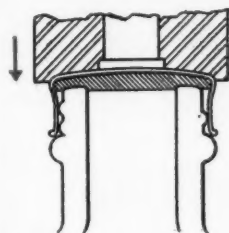


REGENT SPECIALTIES, INC.
268 Lyell Avenue
ROCHESTER 6, NEW YORK

2 THINGS TO REMEMBER ABOUT *Making Money*

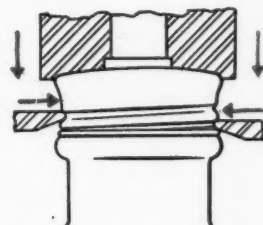


Machines Fast, efficient sealing helps the cost sheet. Alseco machines like this seal 240 bottles per minute, unattended, except for filling hopper. They're smooth-running, trouble-free.



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Want to boost production efficiency?

Alseco's engineers will be glad to work with you on plans for your postwar bottling line. In fact, Alseco may be

able to help you immediately with your present production problems. We'd like to try. Write to the address below.

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SEALS AND SEALING MACHINES

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THERE'S a laboratory-developed, tested and controlled PAISLEY Scientific Adhesive for practically every fabricating, manufacturing, product labeling and sealing operation. New proven formulae are ready to fulfill all government and civilian specifications. Paisley Scientific Adhesives are **GUARANTEED** to do the job satisfactorily or invoice cancelled! Buy adhesives the scientific way. Send for an Adhesive Problem Data Sheet. Fill in and return it to our laboratory for analysis and recommendation. Get the **ONE** best guaranteed adhesive for the **SPECIFIC** operation. Write today! There's no obligation.

ADHESIVE PROBLEM DATA SHEET

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Name of Customer: _____

Address: _____

City: _____ State: _____

Telephone: _____

Product to be Adhesed: _____

Material to be Adhesed: _____

Kind of Joint: _____

Kind of Surface: _____

Kind of Operation: _____

Kind of Adhesive: _____

Kind of Solvent: _____

Kind of Container: _____

Kind of Application: _____

Kind of Result: _____

Kind of Problem: _____

Kind of Solution: _____

Kind of Recommendation: _____

Kind of Guarantee: _____

Kind of Service: _____

Kind of Price: _____

Kind of Quantity: _____

Kind of Date: _____

Kind of Signature: _____

Kind of Initial: _____

Kind of Stamp: _____

Kind of Mark: _____

Kind of Note: _____

Kind of Comment: _____

Kind of Remark: _____

Kind of Observation: _____

Kind of Conclusion: _____

Kind of Summary: _____

Kind of Final: _____

Kind of End: _____

IT'S EASY for you to give us the exact information we need with the aid of this "Adhesive Problem Data Sheet". Properly informed, our skilled adhesive chemists can recommend or develop a formula guaranteed to perform the specific operation successfully. Don't take chances with ordinary adhesive service. Send for a data sheet now!

PAISLEY PRODUCTS INCORPORATED

Manufacturers of Glues, Pastes, Resin Adhesives, Cements, and Related Chemical Products

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has set a high standard . . ."***

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Under Secretary of the Navy

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DESIGNS**

Good design, that impetus to more efficient production and increased sales, is here to stay. Bridgeport is proud to offer this right start and complete service of engineering-tooling-moulding-assembly. Tomorrow's markets will look for the last word in design.

For post-war plastics think of Bridgeport.



BRIDGEPORT MOULDED PRODUCTS, INCORPORATED

BRIDGEPORT, CONNECTICUT

*Tetley uses
Moistureproof
Cellophane
to guard quality*



When the Tetley organization decided to market consumer units of dehydrated foods such as soup mixes and meat sauces, they realized that packaging protection was a most important factor in their program.

Careful tests convinced them that Du Pont moistureproof Cellophane provided the desired protection for these foods by sealing in flavor and sealing out dirt, moisture and external odors. As a result, consumers are impressed with Tetley quality.

If you have a packaging problem in connection with your present or post-war products, we will be glad to work with you in seeing how Cellophane may aid in serving your requirements.

E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington 98, Delaware.

DuPont Cellophane

PACKAGING EXPOSITION
PALMER HOUSE, CHICAGO
MARCH 28-31
*Aid for packaging problems
of War and Post-War.*



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**PRODUCT PROTECTION
IS OUR BUSINESS**

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PAPER MILLS

135 S. La Salle St. • Chicago 3, Ill.

CREATORS, DESIGNERS AND MANUFACTURERS
OF ALL TYPES OF PAPER BOXES, CARTONS AND CANS



CONTINENTAL CAN COMPANY, INC.

proudly announces that the
ARMY-NAVY "E" AWARD

has been conferred upon
PLANT NO. 78, CHICAGO · ILLINOIS
"for outstanding production of war material"

PRESENTED FEBRUARY 19, 1944



SOME OF THE WAR PRODUCTS MADE IN CONTINENTAL PLANTS

Air Conditioning Unit Components
Airplane Carrier Bellcranks
Airplane Drill Jigs
Airplane Motor Sleeves
Airplane Parts
Anti-Tank Mines
Black Powder Cans
Bomb Case Liners
Bomb Fuze Cans
Bomb Parachute Case Assemblies
Bomb Tails
Canisters (37 mm. Projectile)
Cartridge Case Liners
Cavity Charge Containers
Cratering Explosive Containers
Decontamination Unit Containers
Delousing Powder Cans
Depth Charge Pistol Containers
Dubbing Cans
Emergency Drinking Water Cans
Escort Vessel Parts
Ether Cans
Fire Extinguisher Tanks
Flare Fuze Cans
Food Cans
Foot Powder Cans

Fuze Assembly Parts
Gas Mask Parts
Gas Mask Testers
Grenade Canisters (Fiber)
Gun Mounts
Gun Oil Cans
Gun Parts
Hoist and Train Units for Ships
Hydraulic Steering Gears
Hydrogen Generators
Incendiary Grenades and Components
Impregnate Cans
Irritant Gas Grenades
Landing Craft Parts
Land Mines
Latex Collection Cups
Life Raft Ration Cans (Filled)
Lubricant Cans
Machine Gun Parts
Machine Tools and Parts
Maritime Craft Parts
Metallic Belt Links (50 Cal.)
Mine Fuze Containers
Mortar Bomb Carrier Covers
Mountain Fuel Carriers

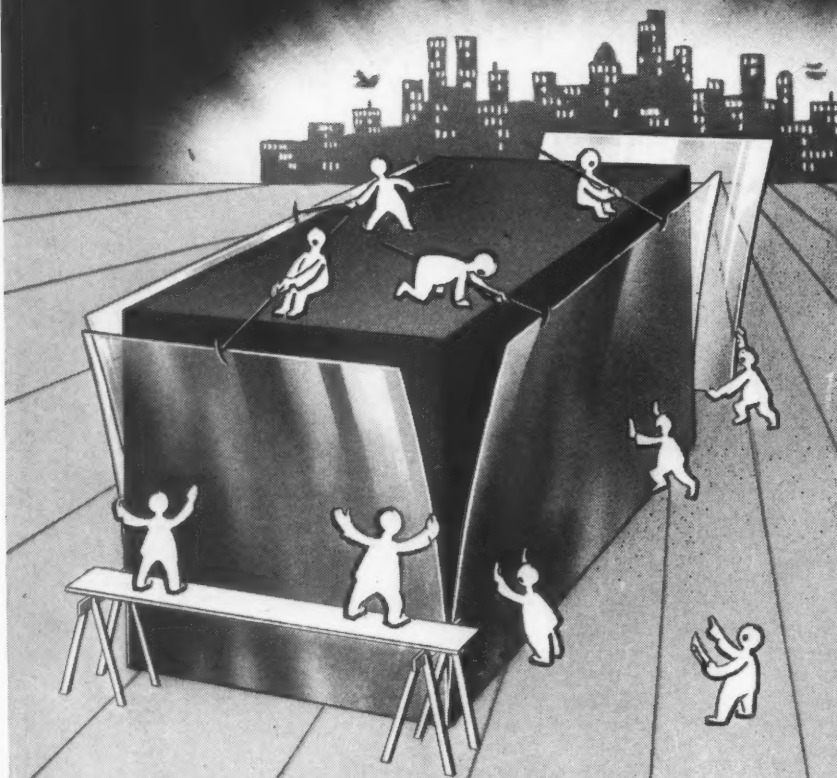
Naval Gun Breech Housings
Parachute Ration Cans (Filled)
Percussion Fuze Cans
Planetary Transmissions for Ships
Photo Developing Powder Cans
Portable Flame Thrower Part Cans
Pyrotechnic Cups
Range Finders
Ration Cans
Recoil Mechanisms (57 mm. Gun)
Rifle Bore Cleaner Cans
Rifle Parts
Sea Marker Cans
Shell Base Plates (75 mm.)
Signal Flare Cans
Small Arms Parts
Smoke Canister Parts
Smoke Grenades
Smoke Pots
Soluble Coffee Cans
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Trailing Axle Assembler
Tools, Jigs and Fixtures

THE POST-WAR PACKAGE

will be garbed in gleaming

LAMCOTE

BEAUTIFIES ★ ★ ★ STRENGTHENS ★ ★ ★ PROTECTS



An era of unprecedented package merchandising will follow the war. The most important factors in selling the post-war market will be (1) **EYE APPEAL**, (2) **PROTECTIVE SEALING** of the contents against dust, moisture, handling and deterioration, (3) **DISPLAY** of suitable types of merchandise through the walls of the sealed package. All these factors are primary functions of LAMCOTE.

Make sure that you investigate the application of LAMCOTE for your post-war package planning.

Reflects the QUALITY of QUALITY PRODUCTS



ARVEY CORPORATION

Laminators to the Post-War Packager

CHICAGO

• DETROIT •

JERSEY CITY



At the
PALMER HOUSE
Chicago
Booths No. 518, 519
March 28, 29, 30, 31

The Story of the man who went looking for Trouble!

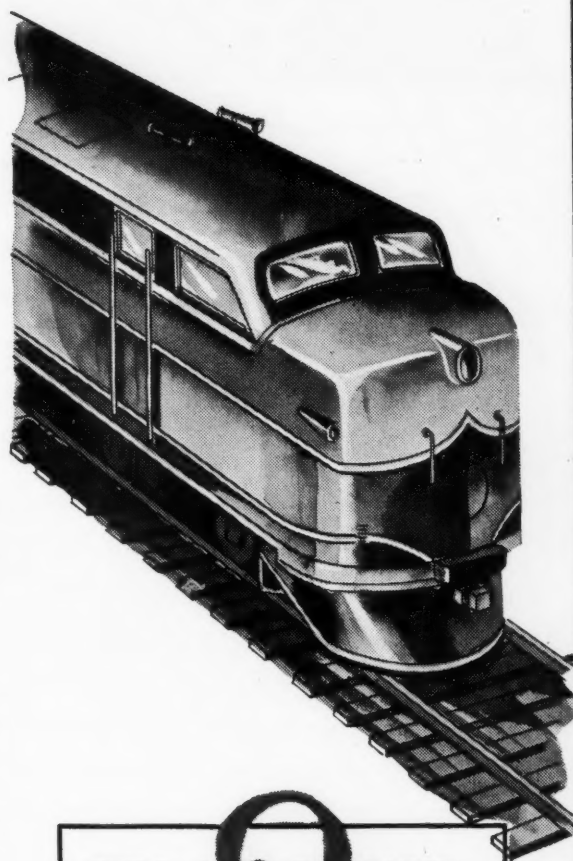


Because everything about his business looked too rosy, a manufacturer of citrus food powders became curious.

He decided to visit his customers. In the south, he found that heat and humidity were often turning his product rancid. Total sales were good, repeat sales poor. Dealers were too busy to complain—but there it was!

Back home he contacted Riegel, found a new paper—no more expensive, easier to handle, no higher priority—which solved his problem.

Almost the entire line of 230 Riegel Papers is being used to protect our food supply and to assist the war effort. The experience gained in developing new papers and new applications of old papers is at your service for today's essential uses and for tomorrow's planning. Why not start looking for some of your post-war troubles now?



WILL YOU BE SATIS-
FIED TOMORROW
WITH THE PAPER YOU
ARE USING TODAY

RIEGEL PAPER CORPORATION

342 MADISON AVENUE • NEW YORK 17, N. Y.



PRECISION

IN MASSIVE MACHINERY

... what the Navy wanted from Kidder
... what the packaging industry will
again get from Kidder

In searching for a manufacturer to turn out certain heavy equipment involving a degree of precision you'd normally expect only on much smaller and lighter products . . . the Navy came to Kidder, builder of heavy printing presses . . . and found what it wanted.

For two years now, Kidder's plant has been devoted almost exclusively to manufacturing military equipment . . . utilizing experience, talents, equipment previously engaged in building high-speed, multi-color presses for the converting industry. The Army-Navy "E" and a Star have been won for excellence in the production of equipment that as yet cannot be revealed.

Soon, we hope, our energies will be redirected to civilian work. We would be interested to learn — now — what *your* plans are for the future . . . so that we may better crystallize *our* thinking to be of maximum help in your post-war planning.

KIDDER... Manufacturer of "3 Point Presses" — so-called because they fulfill the three major requirements for perfect printing . . .

CONTROL OVER THE PAPER



PROPER DISTRIBUTION OF INK



ACCURACY OF THE IMPRESSION



KIDDER PRESS COMPANY, Inc.

PRINTING MACHINERY

DOVER, NEW HAMPSHIRE

126 DIFFERENT GASKETS FOR ONE VEHICLE!



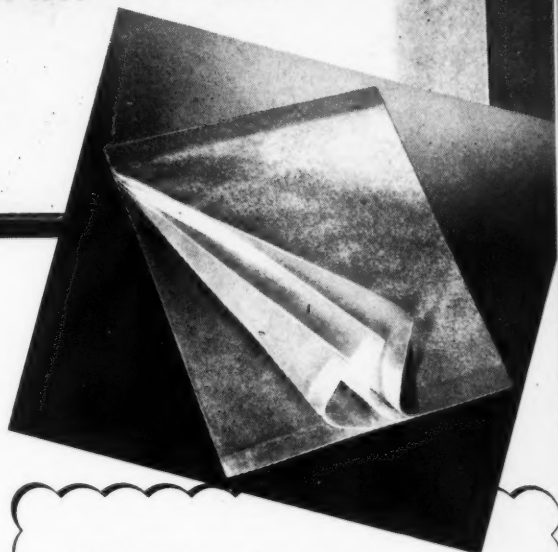
COPPER AND ASBESTOS GASKET

QTY. 4

PART NO. 105454

GROUP NO. 0605E

ITEM STOCK NO. M 3-1-05216



Gaskets are only one of a large number of parts which make up a particular army vehicle. Yet, 126 different gaskets are used in this one machine! Keeping a multitude of ordnance parts and products in factory-bright condition is a job developed to a high degree of perfection by NEOSTYLE *Protective Packaging*! Delicate metallic items, large or small, are protected with amazing new efficiency against dirt and corrosion, whether shipped thru the torrid humidity of the tropics or the frigid sub-zeros of the arctic circle. Better still, keeping orderly inventories of millions of repair parts in the far-flung battle zones has been simplified thru Neostyle's *printed* bags made from ordnance packaging materials.

During this war emergency we've perfected many new developments in protective packaging. Remarkable new methods and materials are now in use effecting enormous savings in labor, trouble, shipping space and weight, as well as aiding in new fighting and feeding techniques, for the armed forces. Invaluable experience has been gained . . . a knowledge of modern protective packaging unequalled, we believe, in the history of this industry. Manufacturers of many different products from huge pieces of machinery or equipment to the smallest portion of food or drugs, are invited to consult with us NOW on immediate war requirements or on POST-WAR packaging plans!

NEOSTYLE T-254 Bags are **HEAT-SEALED** quickly and easily by hand or machine. No staples, no messy dipping or adhesives required. Delamination of this special non-corrosive moisture-vapor-resisting material reveals three layers . . . kraft, acetate, kraft. T-254 bags can be supplied especially printed or plain, in surprisingly short time. These Bags have a MVTR of .076 grams, a PH value of .7-1.0. Samples, suggestions, and estimates incur no cost or obligation.

Neostyle INC.
ESTABLISHED 1898

PRINTED BAGS
ENVELOPES, WRAPS

SPECIAL ORDNANCE
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BOX COVERING
— all types of printed, embossed, coated, glazed papers for decorative covering of boxes and cylindrical cardboard containers. Special coatings for waterproof protection.

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NASHUA
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NASHUA GUMMED AND COATED PAPER COMPANY, NASHUA, N.H.

* SPECIALISTS IN
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**M O D E R N
P A C K A G I N G**

•

Planning for

RECONVERSION

•

M A R C H , 1 9 4 4

V O L . 1 7 N o . 7



Land of Plenty

Not with frantic boast and foolish word do we say ours is a land of plenty. Rather, let it be said with profound thanksgiving, deep humility and a keen sense of responsibility. The fruits of our energy are limitless. Our ingenuity encompasses impossible tasks. Our fertile earth yields abundant crops. Our production machine astounded the skeptics. When a nation can produce and package food supplies for its own civilian population, feed its own far-flung army and navy, and at the same time pack and ship to its allies untold quantities of eggs, cheese, fruits, cereals and other packaged products—that is a miracle of modern industrial economy for which we offer grateful thanks.

But with our thanksgiving there is unavoidably some misgiving. Thoughtful minds are disturbed when they contrast our good fortune with the ruined cities, starving people, wasted fields and prostituted culture in every corner of the globe but ours. We cannot say that is not our concern. We cannot dismiss the problem by pointing to the obvious fact that those conditions are the natural consequences of selfishness and man's inhumanity to man. Whatever the cause, disorder is rampant and no man can tell how long it will take to restore order. One estimate has it that it will require eight years to clean up the rubbish in Berlin. How long it will take to clean the rubbish out of the souls of the troublemakers no one knows. Meanwhile, the problems of all the devastated lands will become our problems. Because ours is a land of plenty, the part we must play will be a difficult one.

That job consists of sharing wisely our plenty with the rest of the world. That is not mere *noblese oblige*. To be bluntly selfish, if we would preserve what we have, we must share it until order and self-support are restored. This means, for the packaging field, that directly ahead is an important part in the postwar job of feeding the world. Containers must be provided to carry the products of this land of plenty to lands less fortunate than ours.

The task will not be easy, but the American way has always been to approach every job realistically. That is especially true of American industry and of the field this magazine serves. When the customary materials for packaging were denied, new substances were devised—and the job went on! As the controls became more strict, they were faced philosophically, adaptations were made—and the job went on! As these new problems become more and more pressing, the job will go on!

As we have pointed out previously, these controls will continue to be in

force for some time. Naturally, as always, we must guard against imposing needless controls that impede rather than help to get the job done, but—as is pointed out in Mr. Krug's article in this issue—the Government has a definite program for the orderly relaxation of government restrictions on the use of packaging materials. This program will be put into force as soon as possible after "X-day." No man in his right mind will oppose this program of necessary regulation; it is the antidote for disorder, chaos, inflation.

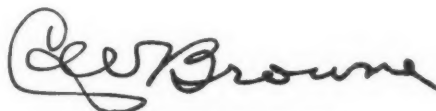
It will be a long time before packaging can resume its normal practices. Speculative generalities will serve no purpose in trying to answer the question, "What substitute packages will remain?" Instead, the situation calls for critical analysis and searching evaluation of all the factors involved. A pattern is suggested by one of the articles in this issue.

Daily, we are told of the changed world which will emerge after this war is over. But the people who consume packaged goods will have the same fundamental desires as always. They may be living in different places, under different conditions, and there may be different age and sex groups to consider. How will these shifts in population affect your product and your package? There will be changes in merchandising methods; the retail outlets will be different physically; there will be changes in the amount and kind of service given the consumer. How will those changes affect your packaging?

This kind of information cannot be presented pictorially or diagrammatically—indeed, it can only be given for any particular product by suggesting a line of thought for the individual maker of packaged products to follow. If we can stimulate constructive thinking, our objective will be attained.

After all, the basic functions of packaging remain the same as they always have been: protection, economy, convenience and appearance will still be the prime objectives. The emphasis will differ from one product or one set of conditions to the next. For most packaged products, we predict that for some time to come the emphasis will continue to be on protection; then, as the world tackles in dead earnest the problem of paying for war's wastes, economy will become imperative. Later, consumer convenience and the merchandising considerations of package appeal will stage a strong comeback and eventually package beauty will return.

Today more than ever, long range planning is essential in packaging. It is the purpose of this issue to provide information and ideas that will enable each reader to chart his own course, so that we can meet the challenge of the intense days ahead.



EDITOR-IN-CHIEF



...changing ways of living

1—River Oaks, Tex., a future community of today with a modern, planned convenience-center for shopping.

by Arthur P. Hirose*

Packages are vehicles to take goods and merchandise to people—to consumers. In so far as human nature is concerned, people may change very little. But war and other experiences through which people pass cannot avoid changing consumers and their habits. Where consumers live, their ages, their sex, their environment, their recent experiences, their income, the kinds of homes they live in, all these factors must be taken into consideration by packaging planners. Here, then, are some of the changed conditions, brought on by the war, that will probably affect consumers in the postwar period:

Population Shifts: The war has caused a great migration of workers. The peace that follows will start other population shifts, but instead of centralization of population in a few big cities, the trend will probably be reversed and people will tend to move into smaller communities.

Decentralization of Population: Cities won't grow at their prewar or war rate, because of their older, multi-storied factories, which lack facilities for economical straight-line production, which have little parking space for workers' cars and which are surrounded by slums.

New Communities: Instead, newer and smaller communities will spring up around the up-to-date one-story factories, since these newer industrial plants are equipped for straight-line production, have adequate parking facilities and, more important, have nearby cheap land on which decent homes can be built for workers.

These newer, smaller communities will be made possible

by more efficient transportation, more and better highways, more economical automobiles, better service from buses and railroads and by an increase in airplane facilities.

Decentralization of population and the growth of newer, smaller communities will also be aided by better communications, in terms of improvements in publishing and printing, increases in the number of telephones and the development of facsimile reproduction, television and radio.

One effect of improved transportation and communication on the consumers living and working in these newer, smaller communities is that branded and packaged goods will be nationally distributed and advertised to a greater extent than ever before.

The newer communities will need stores especially for convenience shopping for consumers and this will result in some changes in distribution. (The subject of distribution is discussed by Arthur Gunnarson on page 102.)

Farm Markets: The decentralization of population and the springing up of newer smaller communities will further break down the isolation of farm families. Better off financially than before the war, these farm consumers will want more of the conveniences of urban consumers. Their packaging requirements will more greatly approach those of non-farm consumers.

Housing: The packaging specialist must be concerned with how consumers live. The newer, smaller communities that will result from decentralization of population will force a change in housing. In prewar years, the average number of new home units built was usually about 350,000 a year. The war halted all but essential home construction. As a result,

* Director of Market Research and Promotion, *McCall's* and *Redbook* magazines.



the United States faces an acute housing shortage. It is expected that one activity to keep the nation out of a depression will be a greatly enlarged home-building activity, which may well reach the proportions of 800,000 to 1,000,000 new home units built each year for as many as 10 years.

New Homes: No enlarged home-building activity after the war could exist solely in the construction of the \$10,000 and \$15,000 home. Instead the great bulk of the new homes will be in the price class below \$5,000 to meet the needs of the masses of consumers. Prefabrication of homes will become increasingly important.

The new homes of tomorrow, in which an increasingly large number of our consumers will live, will have these characteristics:

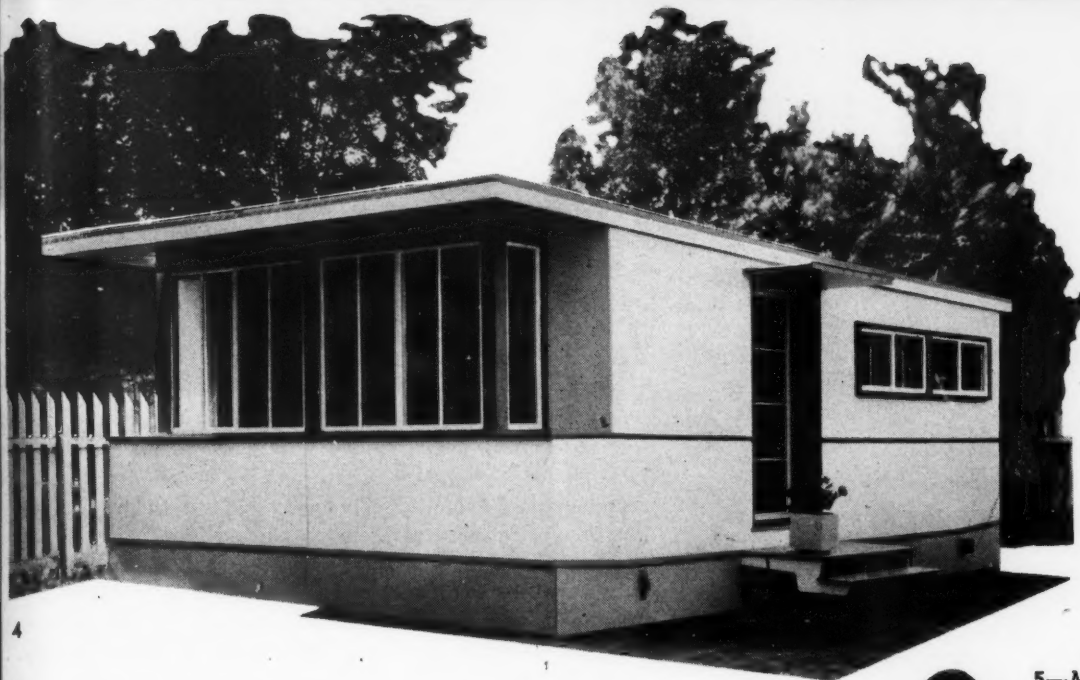
- More one-story houses
- Less attics
- Fewer basements
- More flat roofs
- More windows
- Fewer rooms, but larger rooms
- More dual-purpose rooms
- Fewer dining rooms
- More closet and storage space
- More built-in features
- More labor-saving appliances

All of these innovations, it will be noted, are designed to make the job of housekeeping less burdensome to the housewife and more enjoyable to the other members of the family. The accent will be on labor-saving and on time-saving. As a corollary, those packaged products which contribute to the saving of time and labor will be more welcome to the consumers of tomorrow.

Kitchens: A larger proportion of packaged products find their way into the kitchen than into any other room in the home. One of the most important changed consumer conditions of significance to packaging people will be the greater mechanization of kitchens in new homes. Faster and more



2—This all-glass, ultra-modern kitchen cries out for attractive packages to be seen through glass fronted cabinets. 3—Another important consideration in this kitchen is the amount of storage space. Smaller and more compact kitchens will have to have packaged goods scaled especially to fit the available shelf space. Convenience will be most important in servantless homes.



4—Prefabricated and low - cost homes will need smaller package units to meet the requirements of these compact, new dwellings.

accurate cooking devices, automatic refrigerators with greater capacities for frozen foods, automatic clothes-washers and dishwashers will be found in the new kitchens.

The kitchen will be the chief "dual purpose" room in the home of tomorrow. Usually it will be combined with the dining space in the home and may also embrace a home laundry. This means that products and packages will be more on display in the home than they have been in the older houses with separate kitchens and old-fashioned basement home laundries.

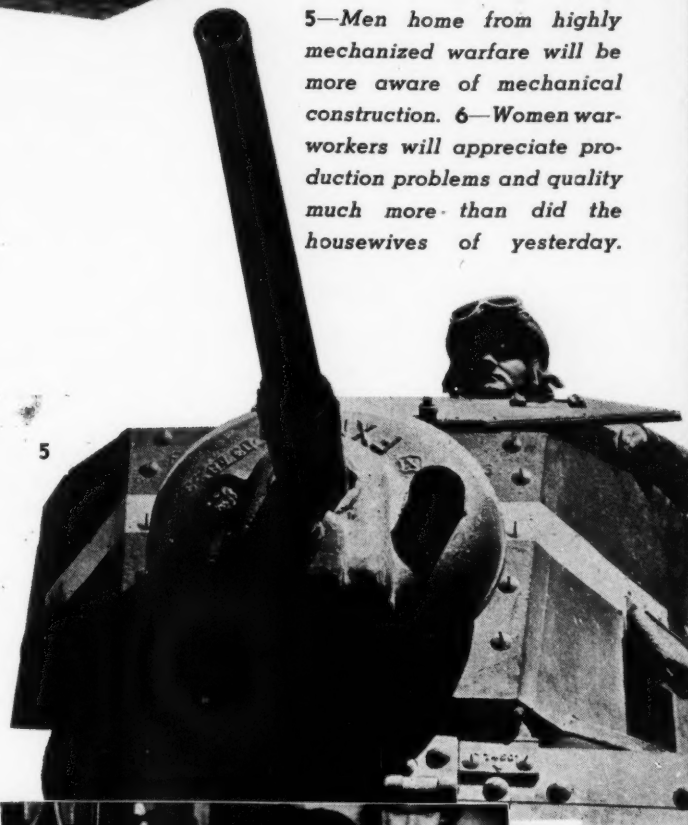
Fewer Servants: Kitchens in new homes will depend more on labor-saving appliances, not only because the trend is toward that equipment, but also because the servant class in our population is probably going to decline in numbers. So many domestics have gone into factory jobs where pleasanter work, shorter hours and higher wages will make them reluctant to go back into household service. A result of the decline in the domestic or menial class will be that commercially manufactured products will more and more have to take the place of home labor. This opens up a whole new vista for packaged merchandise which the wise manufacturer must consider.

Fewer Young Consumers: Wars cut down the supply of young people in the population. It is true that recent war years have seen the largest number of marriages and the biggest crop of babies in the nation's history. But with millions of our men abroad in military service, and with casualties, there will be fewer young people in their 20's and 30's and fewer children in the postwar period.

More Older Consumers: Conversely, the older people will constitute a larger percentage of the population of the United States.

It is possible that consumers may divide, after the war, into two rather distinct markets—the young and the old—to a greater extent than was the case in prewar days. The young people who are now in war plants and in the armed services are getting an intensive education in technical developments. To a young soldier, a walkie-talkie is not a marvel of science but merely an accepted part of his life. To young men in the navy and the air corps, Radar is a commonplace, not a hush-hush mystery. To young men and women in war plants, air-conditioning, fluorescent (Continued on page 210)

5—Men home from highly mechanized warfare will be more aware of mechanical construction. 6—Women war-workers will appreciate production problems and quality much more than did the housewives of yesterday.



WILL THEY LAST?

This realistic study grew out of a survey made by a contributor who prefers to remain anonymous. After serving a term in WPB, he returned to his company to make—for its postwar guidance—a thorough study of substitute packages. The reader may not agree on all points, but he will undoubtedly follow the method and scrutinize the conclusions with keenest interest.

THE EDITORS

It cannot be denied that many of the conversion packages adopted since the beginning of the war represent only a temporary expedient. Many are limited strictly to the war emergency period, with no thought or desire on the part of the user to adopt them permanently. Yet, inherent within the idea lies the possibility that some of the present conversion package developments may have produced results which cannot be overlooked or discarded readily in the postwar years. In making an appraisal of this subject we have two major and definitely conflicting factors to consider:

1. The natural desire of conversion package manufacturers to consolidate and make permanent the gains they have secured in new markets which, in many cases, were never before open to them.
2. The knowledge that when the war is over the package manufacturers who formerly controlled these markets will certainly re-enter them determined to regain the accounts and volume of business which they had to sacrifice because of the national emergency.

In considering the determined competition which will result from these conflicting interests, it must be obvious that if the service given by the conversion package does not equal that offered by the previously used package, then there is little likelihood, in fact, for its retention, all the wishful thinking and hoping of the conversion package manufacturer to the contrary notwithstanding. However, if the conversion package development has been done on a sound engineering basis; if the newly adopted package fulfills satisfactorily the several requirements of adequate product protection, economy of manufacture and use, adaptability to large-scale production on automatic equipment, and appeal both to dealer and ultimate consumer, then its adoption may be considered quite likely to be permanent.

For the sake of clarity, it may be well to state that while the above line of reasoning applies both to industrial as well as consumer goods, we shall confine our present appraisal to the latter group, with which we are all familiar and which has the largest total number of packages purchased and used. In so far as packages for industrial products are concerned, these usually contain large and bulk units, which accounts for the fact that protection of the product, serviceability and economy are the all-important factors. Consumer convenience, eye-appeal and merchandising value require relatively little consideration.

A discussion of "war-born" conversion packages and a basis for judging their continued use in the highly competitive postwar years.

In order to gain first-hand information about the thousands of conversion packages which have replaced former ones, it is only necessary to visit a few retail stores, where the character and extent of the changes will become readily apparent. In such a study it will be noted that there have been eight major changes as shown on the opposite page.

The term "all-paper" is used in its generic sense, embracing: (1) *All kinds of papers*, whether sulphite, sulphate (kraft), parchment, glassine or cellophane; used in single thickness or combined in several plies; with or without special adhesives, and used as inner liners, wrappers or bags. (2) *All kinds of paperboards*, regardless of the fabricated form, whether in folding or setup boxes, spiral or convolutely wound cans, cones or cylinders, and used in single or multiple thicknesses, with or without special adhesives, lacquers or other protective coatings. (3) *Any combination of papers and paperboards*.

While it would be possible to compile an almost endless list of products now appearing in conversion packages, we can readily illustrate the extent of the changes effected by examining a representative number of products sold in three major types of retail outlets, namely, drug, grocery and hardware stores. In order to indicate clearly the nature of the change, a numeral has been placed following each specific product corresponding to the eight changes tabulated on the opposite page beneath the photograph.

DRUG STORE PRODUCTS

Adhesive Bandages	1	Hair Dressings (Negro)	1
Aspirin, Cold, Laxative		Laxatives, Granular	5
Magnesia Tablets	1	Manicure Cotton	1
Bath Salts	1	Milk Sugar	5
Bicarbonate of Soda	1	Nursing Nipples	8
Boric Acid	1	Saccharin Sodium	5
Brewer's Yeast	5	Talcum Powder	1
Brushless Shave Cream	3	Tar Soap	1
Epsom Salts	5	Tooth Powder	1 & 4
First-Aid Kits	1		

GROCERY STORE PRODUCTS

Baking Powder	2	Frozen Eggs	1
Bouillon Cubes	1	Fruit Cake—5 lbs.	1
Cheese—5 lbs.	7	Fruits & Vegetables	3
Chewing Gum	6	Lighter Fluid	4
Chewing Tobacco	7	Little Cigars	1
Chocolate Wafers	8	Molasses	3
Chocolates, Assorted	1	Pipe Tobacco	1
Cigarettes—20's	6 & 8	Plug Tobacco	1
Cigarettes—50's	1	Popcorn	1
Cigars—50's	7	Potato Sticks	1
Cocoa—1½ lb.	1	Salt Codfish	7
Coffee—1 lb.	1 & 3	Salted Nut Meats	1
Coffee Substitute	1	Scrapple or Souse	1
Cookies—5 lbs.	1	Shoestring Potatoes—	
Dates—2 lbs.	1	3½ oz.	1
Dehydrated Vegetables	8	Shortening—1 lb.	1
Disinfecting Powder	5	Shortening—3 lbs.	4
Dog Food, Dehydrated	1	Spices	1
Fish Fillets, Fresh & Frozen	1	Tea	6

(Continued on page 92)



WARTIME PACKAGES REPRESENT EIGHT MAJOR CHANGES

1. From all-metal packages to all-paper packages.
2. From all-metal to paper packages with metal ends and closures.
3. From all-metal packages to glass containers with metal closures.
4. From all-metal packages to glass containers, with nonmetallic closures, i.e., paper, plastic or wood.
5. From packages with metal ends and closures to all-paper packages.
6. From all-metal foil-wrapped packages to all-paper packages.
7. From nailed, all-wooden packages to all-paper packages.
8. From cellophane packages to all-paper packages.

HARDWARE STORE PRODUCTS

Battery Boxes (dry cells)	1	Paints & Varnishes	3
Bird Seed	1	Paint Brush Cleansers	3
Camphor Tablets	1	Piston Rings	5
Faucet Washers	1	Plant Food—1 lb.	5
Fish Food	5	Scouring Powders	5
Lawn Seed	5	Water Color Paints	1
Lunch Kits	1	Wax Crayons	1
Moth Exterminator	1	Wooden Forks & Spoons	8
Nails, Household Assortment	1		

An examination of this representative, though incomplete, list of products which are now being marketed in conversion packages will show that they comprise three broad groups:

1. *Dry products*—Powders, granular and shredded, pills and tablets, solids.
2. *Moist and viscous products*—Creams, pastes and spreads, solids.
3. *Fluid products*—Watery, oily and syrupy.

While at first glance most of the conversion packages, now in use, may appear to be satisfactory, it would be foolish, indeed, to either praise or condemn them as a whole. It is only when we know what changes may take place to affect adversely an individual product, the cause of these changes, and what protective qualities are necessary therefore, that we can judge intelligently how well or how poorly the conversion package is doing its job, and then hazard a guess as to its probable retention or discard in the postwar period.

In general, there are ten possible ways in which a product may be affected adversely:

1. Change in physical state, from its natural size, shape or structure such as dry, moist or fluid to some less desirable form.
2. Change from soft and pliable to hard and brittle.
3. Change from thin to thick.
4. Change in appearance.
5. Change in color.
6. Change in taste.
7. Change in odor.
8. Change in acidity or alkalinity.
9. Change in edibility.
10. Change in chemical structure, bacteria count, etc.

Seeking the reasons for these unfavorable changes we find that there are eight major causes, as follows:

1. *Air*—Dry air may cause the product to give up some desirable feature such as the loss of moisture in tobacco. Moist air, absorbed by the product, may change its form. A fine powdery substance may become hard and lumpy. Hot air may cause a change within the product such as producing a white bloom or coating on chocolates.
2. *Gas*—Gas may be formed in the product such as carbon dioxide in ground coffee.
3. *Water*—Water coming in contact with the product may render it useless such as rust forming on the finely ground metal surfaces of piston rings.
4. *Moisture-vapor*—A combination of air and water may cause the product to form into lumps as in salt, sugar, baking powder or flour.
5. *Extreme heat*—Heat may cause a product to melt, cloud up, become discolored, turn rancid, generate gases or cause some chemical changes within it.

6. *Extreme cold*—Cold may thicken, solidify or cause a change in taste as in fresh vegetables.
7. *Light*—Exposure to or the infiltration of certain light rays may affect products variously and negatively, such as: causing certain colors to fade; causing nut meats or dried eggs to become rancid; causing dried eggs to generate harmful gases; causing photographic film to be ruined by premature exposure; causing chemical changes in medicine.
8. *Packaging materials*—The product may give up its own distinctive flavor and absorb some foreign odor peculiar to the materials used in manufacturing the package or there may be discoloration of the product by a reaction set up between some element in the packaging material used and the product.

In pointing out the possible ways in which products may be adversely affected and naming the principal causes for these changes, our purpose has been simply to emphasize the fact that the value of a particular kind of package cannot be determined by examining it casually. And we are further convinced of the fact that many of the opinions being cast around these days about the certain retention of some conversion packages and the certain discard of others have no foundation in fact. Actually they are either sheer guessing or just wishful thinking.

The sound development of an entirely satisfactory package for postwar days will take pretty much the same painstaking study and research that went into the development of an entirely satisfactory prewar package. The new thing which has been added is the fact that the entire subject of protective packaging has been given new emphasis. The result of this is that things considered impossible for years have been studied and most encouraging progress has been made. Thus instead of being confined to one or two ways in which a certain type of product can be packaged, there are now several potentials which must be investigated and studied before arriving at a final decision.

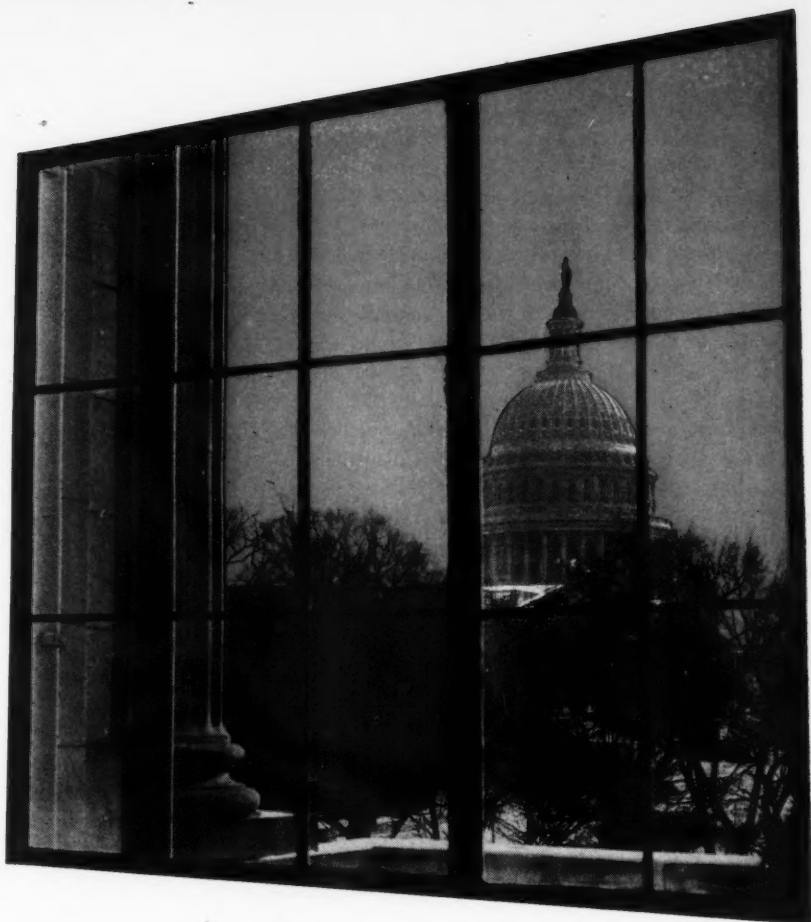
It is plain foolishness to believe that every product which was formerly packaged in metal, and switched to some form of paper "for the duration," will immediately revert to metal once the hostilities cease. On the other hand, it is as foolish to believe such products will all remain in paper and be lost forever to the metal package manufacturers. While there is bound to be determined competition between the manufacturers of various kinds of packages, if the product manufacturers have really profited by their war experiences, they will probably act less on guessing, "hunches" or mere precedent, and will resort to a truly package engineering approach. Through careful study and testing they will arrive at decisions based on accurate facts, rather than on what they used prior to the war, or were forced to use during the war.

To utilize the package engineering method of developing a suitable package involves an orderly procedure by and through which every major factor is given due study and consideration. A typical outline for such a study would include the following eight steps:

1. Set down in writing complete information about the product and the size unit or units in which it will be packaged.
2. Determine the factors which may affect the product adversely and the specific ways in which the product may be changed thereby.
3. Establish the exact pro- (Continued on page 220)

HOW LONG GOVERNMENT CONTROLS?

by J. A. Krug*



For some time to come, it will be necessary for our industrial productive economy to continue to operate under Government restrictions. This is one of the chastisements of war. The aftermath of war, too, will call for careful over-all planning in the uses of materials, not only for packaging but for every other purpose as well. In wartime, there is no alternative for Government restrictions. In the postwar period, the alternative would be disorderly stampedes to buy materials at prices that would lead to the wildest kind of inflation.

Everyone in the packaging field should have an understanding of the nature of these Government controls as they apply to every department of business. It is the purpose of this paper to describe briefly WPB machinery for integrating production programs and to forecast—as far as is possible at the present time—the orderly program of relaxation of restrictions which will follow victory.

First, it is necessary to bear in mind that while WPB has certain over-all responsibilities, the detailed planning of wartime production is not in the hands of any one agency. The job has been decentralized so that each department is assigned that portion which is its specialty. Thereby expert knowledge and experience are brought to bear on every problem. The Army is responsible for the Army supply program. The Navy provides warships, naval ordnance and other specialized naval needs. The Maritime Commission plans the merchant ship program and a large number of civilian agencies develop the production and construction program required for indirect military purposes and for supporting the basic civilian economy.

WPB is responsible for the production of the basic materials, components and products which are required jointly for the

programs of the other agencies. WPB also provides through its Requirements Committee and its Divisional Requirements Committees for the integration of the production and construction programs sponsored by the military and the interested civilian agencies. In other words, the job of these committees is to balance proposed programs with the productivity of the nation's industrial resources. To carry out this function, the Requirements Committee operates directly with the major military and civilian agencies, fourteen in number, called the "Claimant Agencies." For the purpose of claiming materials and obtaining approval of production and procurement programs, each of these fourteen agencies is assigned jurisdiction over a specific area of production. The areas covered by each of the claimants are:

Aircraft Resources Control Office: Production of airplanes and parts for Army and Navy Air Forces and Lend-Lease; construction and facilities for airplane production.

Army: All Army ground supplies and matériel (including Army type Lend-Lease equipment) and related construction and facilities.

Navy: Ships, ordnance equipment, advanced base and continental base construction and related facilities (including Navy type production on Lend-Lease account).

Maritime Commission: Merchant shipping and military shipping built in Maritime yards; ship repairs except in Navy yards.

Foreign Economic Administration: Lend-Lease requirements other than military type, including raw materials and industrial equipment of all varieties; miscellaneous exports to non-Lend-Lease countries, largely Latin American; foreign projects, largely for the United Nations' benefit, such as petroleum, mining, crude rubber development and lumbering.

War Food Administration: Farm and food-processing ma-

* Program Vice-Chairman, WPB, Washington, D. C.

chinery, food storage, food containers, supplies and equipment for farm use; farm construction and repair.

National Housing Agency: War housing, both publicly financed (Federal Public Housing Authority) and privately financed (Federal Housing Administration).

Petroleum Administration for War: Oil well drilling, refining, pipe line transportation and petroleum marketing; construction of high octane gasoline and related projects; maintenance and repair for the petroleum industry.

Office of Rubber Director: Production of synthetic rubber and rubber products of all types; construction and maintenance of plants for production of rubber, tires, etc.; rubber-making and rubber-working machinery.

Office of Defense Transportation: Railroad construction and maintenance; production of railroad and automotive equipment and repair parts; local and interurban transit requirements, both rail and automotive; inland waterway construction, equipment; maintenance and repair.

Office of War Utilities: Requirements for construction, maintenance and repair for electric power, telephone and telegraph, natural and manufactured gas, water and central steam heating industries; production of power and communications equipment, land boilers, etc.

Office of Civilian Requirements: Consumer goods and services of all types, including maintenance and repairs for household or consumer use (except farms). The OCR is also responsible for the wholesale and retail trades.

Operations Vice-Chairman: Producers' goods of all types, including equipment common to military and non-military use, such as construction machinery, general industrial equipment, containers, lumber machinery, plumbing and heating supplies, textile machinery, machine tools, etc.

Metals and Minerals Vice-Chairman: Construction and maintenance requirements for the basic minerals industries; production of mining machinery.

Under the Requirements Committee system, each of these Claimant Agencies submits quarterly to WPB a complete description of its proposed production and construction programs translated into quantities of "controlled materials" including carbon steel, alloy steel, copper, brass and aluminum. Where other critical materials, such as rubber, lumber, paper, mica, etc., are needed in large quantities or where proposed programs involve critical common components or the procurement of end products which are in short supply, requirements data covering all such items are also requested. The quarterly programs show a complete breakdown of the proposed production schedules and construction projects for the succeeding calendar quarter, and at least a summary outline for an additional nine months ahead. Through these programs WPB has, at all times, a picture of proposed industrial activity for a full year's period.

The over-all Requirements Committee, with each Claimant Agency represented, resolves competitive demands for materials and facilities which cannot be satisfactorily adjusted at the Industry Division level where the Division Requirements Committees function in the initial process of adjusting various programs. The Requirements Committee is assisted by the Program Adjustment Committee, which is the task force for distilling the basic facts from the mass of information presented so that the principal points of issue can be focused before the main Committee.

As things work out in practice, the staffs of these various committees review carefully the estimated requirements for proposed programs. They eliminate statistical inaccuracies and mistakes in bills of materials. They also check

to make certain that the proposed production schedules are reasonably in balance, for example, that the proposed production of shell cases matches up with the availability of shell fuses. The feasibility of the schedules is also examined in such terms as the rate at which the needed critical components could be fabricated. Adjustments are also made for known inventory positions. Export programs are reviewed in the light of all available information of conditions abroad, shipping possibilities and agreements as to the distribution of the production load between our allies and ourselves. Proposed civilian and indirect military programs are carefully checked on the basis of past experience and present essential needs.

At the same time that requirements are under review, each Industry Division responsible for a critical material or product in short supply carefully estimates the expected production for the quarter under review and, in a more summary fashion, for the next three quarters. This provides a supply picture corresponding to the twelve-month period of programmed production and construction.

Where, after staff analyses, the adjusted requirements for materials, components or products exceed the estimated supply, the Divisional Requirements Committees develop tentative trial balances adjusting the proposed programs of the Claimant Agencies to the forecast of supply. In the case of all basic materials, such as steel, copper and aluminum, these trial balances are reviewed in the Requirements Committee and an over-all integrated production and construction program agreed upon.

The over-all program, as thus determined, is implemented with respect to steel, copper and aluminum under the Controlled Materials Plan, each agency being allocated a sufficient quantity of these materials to provide for the program finally approved by the Requirements Committee. In the case of Procurement Agencies, such as the Army and Navy, the approved program is further implemented by the adjustment of procurement schedules to correspond with the quantities of materials allocated under the Controlled Materials Plan.

For other critical materials not handled under the Controlled Materials Plan, the approved programs are implemented under allocation and production scheduling orders of WPB. These orders are used to allocate such materials as rubber, nickel, zinc and many chemicals. Production scheduling orders are used to control the production of all other critical items. Conservation orders promote the use of less critical materials as substitutes, while limitation orders fix the authorized production of those products which are restricted in order to free materials and facilities for more urgent military and civilian programs. At the same time, construction and facilities expansions are limited to projects proved to be essential.

Through this procedure, it has been possible to surcharge the nation's productive capacity with the full complement of programs most urgently needed in the war effort. As the prosecution of the war program steadily accelerated since Pearl Harbor, the proportion of military production was continuously increased until late 1943, when it had squeezed out all but the minimum of basic civilian needs.

No one can clearly forecast the trend of the war or when victory will come. The needs of war are by their nature so dynamic that at all times the system of production control must be flexible enough to accommodate major and unforeseen military needs. At the same time, the essential requirements of the civilian population (*Continued on page 222*)



PHOTO, THREE LIONS

1—American labels may be seen on shelves of company store at Llallagua tin mine in Bolivia

TOMORROW'S PROSPECTS FOR EXPORTS

When the war is over, and sea and air lanes are again opened for commerce, practically every inhabited place in the world will be a market for either heavy industrial or consumer goods.

The need of industrial production to rebuild whole cities the size of Chicago or Detroit, to replace machinery for running factories and farms, to restore power plants, to rebuild railroads and bridges, to feed and clothe the homeless populations is stupendous enough to rock the imagination.

In addition to the reconstruction of devastated areas, undeveloped hinterlands of South America and Asia will be waiting, like our own West of the 19th century, for industrialization to raise standards of living to a par with the rest of the civilized world.

To American business this means export—export on a scale Americans have never dreamed of before. It means competition—competition with every nation of the world. It means packaging—scientific packaging like that learned in global warfare—packaging to supply the merchandising and protective requirements of any place on earth.

In anticipation of those requirements, export managers say it is none too soon to make an appraisal of these markets. Representatives of other countries are already in foreign capitals making their plans. Americans should forget their provincialism and get on the job immediately if they are to win the place in world trade that the United States should hold in the future.

How far American foreign trade in the immediate postwar period will be undertaken by private interests depends to a large extent on the future of Lend-Lease. During 1943, Lend-Lease exports constituted \$10,100,000,000 or 79 per cent of total exports which were estimated by the Department of Commerce to be \$12,116,902,000. Because of the benefits accruing from this arrangement to foreign governments and to American manufacturers as an outlet for production, it will probably be continued as long as the American taxpayer will foot the bills. Edward Stettinius recently has "taken time during the war to get down in book form the origin and development and the significance as I see it" of the Lend-Lease program (*Lend-Lease—Weapon for Victory*, The MacMillan Co., 1944). Just how the Lend-Lease program will be carried out in the future is an open question.

It is not the purpose of this article to appraise or criticize U. S. foreign policy, however, but rather to point out a few aspects of future trade possibilities that may be helpful to the American manufacturer with packaged goods to sell.

Most ready markets for American postwar production, according to popular opinion, are the 20 Latin American countries. Due to favorable trade balance with the United States built up through our heavy purchases of tin, copper, essential oils, manganese and other raw materials, as well as large quantities of canned and processed foods, every Latin American Republic has been changed in the past three years from a debtor to a creditor nation. More than a billion dollars has



2—Seed packets in a Brazilian street market. 3—Much laundry soap is sold in bulk in South America, so many centavos a hunk. 4—Cinchona seedlings to produce quinine, packed in moss and shipped Air Express from the States to Latin America by Department of Agriculture to replace Far East supply.



3

already been accumulated for the day when the manufactured goods which cannot be bought now will be available.

The exporter, however, who is looking to South America for a share of his business should know something about the changes which have been taking place during the war. Such changes are bringing about a shift from consumer goods to production goods. Importations of industrial machinery are being encouraged by reductions and in some cases exemptions from duties.

Cut off from imported goods formerly obtained from Europe and the United States, these countries have encouraged greatly the local manufacture of foods, drugs, toiletries and cosmetics formerly brought elsewhere. Not being able to buy these products or the materials to package them from the outside, Latin America has made big strides in the development of facilities for making and packaging these products and materials at home.

According to *Elaboraciones y Envases*, Latin American packaging magazine published in the United States, practically all types of toilet soaps, cosmetics, perfumes, dentifrices, lotions, etc., are now being produced in Brazil on an increasing scale. In 1942, Brazil manufactured 30 million boxes of talcum powder, 12 million tubes of toothpaste, 10 million containers of rouge, 6 million bottles of lotion. Locally made toilet articles, soaps and perfumes were exhibited in Peru at a recent pharmaceutical congress. In Argentina, more than 2,000 medical specialties are now being made.

In Latin America there are some 100 paper mills making all kinds of papers except high-grade decorative papers for which they do not yet have the machinery and which they are getting along without for the duration. Latin America has always been tin minded and used a great deal of tin packaging. Today, because they have sold most of their tin and steel to the United States, they, like ourselves, are getting along without metal containers, but have worked out their own substitutes of paper and glass.

Some sources say there are about 300 glass manufacturing plants in Latin America, a number of them making containers. The United States Government has authorized a subsidy for a glass plant to be established for the making of rum bottles in Puerto Rico. Glass containers are an important item



4

5—Cigarettes are sold in open market places in China. 6—Sales are made from open packages, the buyer purchasing two or three cigarettes at a time. Machinery and packages to put up small packets of two or three cigarettes, like sampling units in this country, would be big aid to Chinese cigarette maker

5



6



PHOTOS COURTESY FOREIGN COMMERCE WEEKLY

since 180 Latin American breweries produce more than 700,000,000 gallons of beer annually. Their soft drink business is tremendous and is constantly increasing, thus requiring additional millions of glass containers and crown caps.

Another interesting phenomenon of the industrial awakening in Latin America is the changing attitude of the landed gentry. As of other agrarian continents, it has been said that South America is owned by a few hundred families. These land-holding families for centuries have had contempt for trade. Their sons were prepared for military, political or professional careers, but not for industry. This tradition is dying with the industrial revolution in these countries.

It is not infrequent today to find the owner of a *hacienda* operating a small railroad to carry his agricultural products to the nearest shipping point. If he owns a sugar plantation, he may own a refinery, a packing plant, a rum distillery. He may even go into the candy business on the side. If he does, he becomes interested in boxes and wrappings for the candies thus produced. If he raises coffee, he may have a roasting plant and pack his coffee in bags, cans or jars on the premises. If he raises cattle in Argentina, he may have a dairy and a cheese processing or milk bottling plant.

All such manufacturing or processing requires machinery, equipment and supplies. When these men undertake industrial enterprise as an adjunct to their plantations, they become more and more interested in production methods and equipment. Therefore, the manufacturer of package machinery and package specialties in the United States should have an excellent market for his products in Latin America. Indication of this trend is revealed by the increasing number of inquiries received in the States by publications specializing in such fields.

The Latin American packager is also very much interested in plastic materials—flexible films and closures particularly. To date, there is a little plastic manufacture in South America and many locally packaged goods may be seen with locally made plastic closures, sometimes of synthetics derived from local agricultural products.

Many Latin American packagers were using pliofilm before the war, purchased in the United States. Cellophane has been promoted widely and is used for many products. This too must come from the States as cellophane is not yet manufactured in South America.

The exporting of finished goods will not be so simple after the war, since the Latin Americans, proud of their local industry, are already imposing trade barriers to keep out products which compete with local manufacture.

The trend, therefore, is for American companies to set up local plants for the manufacture of their products right in the country where they are to be sold. A new plant of this type is to be opened soon in Mexico by E. R. Squibb and Sons. Other makers of drugs, toiletries and cosmetics as well as food processors have similar projects underway or have already established such plants.

Such undertaking offers an opportunity for younger packaging men to enter the foreign trade field, since a trained production man, a product research man and a packaging engineer are usually selected from an American plant to head up these enterprises.

One export manager said he believed that many young men returning from overseas would be attracted to this field. "They will never be satisfied to go back to their small home



7—In designing export packages, E. R. Squibb & Sons must consider climatic conditions, breakage, contamination, local government regulations, tariff laws, transportation problems and local purchasing habits. 8 and 9—Examples of cellophane packages packed in Latin America. 10—Maté packages in local display promoting cellophane. 11—Carters Little Liver pills correctly packed for "down under"—small packets shipped in tens for metric inventory.

towns," he said. "They will have seen too much of the world and will want to see more." This is a good thing for American business in foreign lands, he believes. Too often in the past, our foreign representatives were "tourist" salesmen, who never wanted to stay away from the States more than a few months.

Whether the Latin American countries spend their accumulated dollar values in the United States or elsewhere after the war depends to a large extent on the kind of treatment they get from us.

The possibilities for the American exporter are tempting. They include everything from heavy industrial goods to radios, refrigerators and household appliances as well as packaged goods. For no matter how much local manufacture there is, there will still be a place for packaged specialties and luxuries, which always have sales appeal in the foreign retail trade simply because they are imports. Examples in our own country are French fashions and perfumes, English chinaware and woolsens.

Such goods exported by American industry must be packaged carefully to suit the requirements of the local market. Smart merchandisers are sending their representatives to these countries to make advance market studies and thus avoid the glaring mistakes that have been made in the past.

The exporter must know that he may be selling in countries where only a small percentage of the population has any purchasing power at all. He must know the proper unit size for his package so that it can be priced in line with local consumer purchasing power. For example, one American company recently sent pound packages of corn starch to South America. They didn't sell. It was discovered that the local consumers bought corn starch only in quarter-pound sizes. Before the war, Carters Little Liver Pills in glass vials, priced in the United States at about 25 cents, were not selling at all in South America. After a little research, it was found that similar products were selling well in the same areas, but were packaged in small units of four or five pills to the package priced at an equivalent of five cents in U. S. money. When Carters changed their vials for small cellophane packets containing only a few pills, their product was able to compete in the foreign market with similarly packaged goods.

The exporter must know, too, the psychology behind his

selling in foreign lands. A round face-powder box with full-topped cellophane drum, for instance, is a preferred cosmetic container in the United States because American women like to get a good full view of the powder shade. In Latin America a cellophane window drum is preferred. The rest of the drum top is paper which allows more of the perfume scent to escape from the package. South American women purchase powder more for scent than color.

Most Latin American countries use the metric system in business. Although many American companies still ship their orders to Latin America in pounds and dozens, due to the difficulty of handling other units on American production lines, the same products would find more ready acceptance "down under" if they were packed in kilos and centimeters. Translation of inches or pounds into the metric system makes very awkward fractions for accounting departments. Most European countries use the metric system. Perhaps, the United States and Great Britain might do well to adopt this standard system of weights and measurements too, particularly for international trading purposes.

One of the reasons we were unsuccessful in selling to Latin America in the past was because of just such inattention to their way of doing things as this, and one of the reasons why the Germans, who did adapt themselves to the ways of the countries in which they did business, gained such a foothold before the war.

Much has been said in the past about faulty export packaging—such as inadequate protection in hot climates, poor shipping boxes, leaky containers, etc. This is the surest way to create ill will in a foreign market. Export managers say such things don't happen any more.

This may be true, yet this phase of export should be constantly watched. Only last year, Rea Hanna, a member of an American Insurance firm in Valparaiso, Chile, complained in the *American Import & Export Bulletin* of the "commercial carelessness" of American shippers. He cited certain shipments of glassware to Chile. The purchaser sent a repeat order three times, specifying the type of container he wanted to prevent damage, but each time the duplicate shipment arrived in the same type of faulty container, 60 per cent, broken. This may have been an isolated case and not typical, yet even one such mistake can cause untold harm.



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PHOTOS, DUPONT

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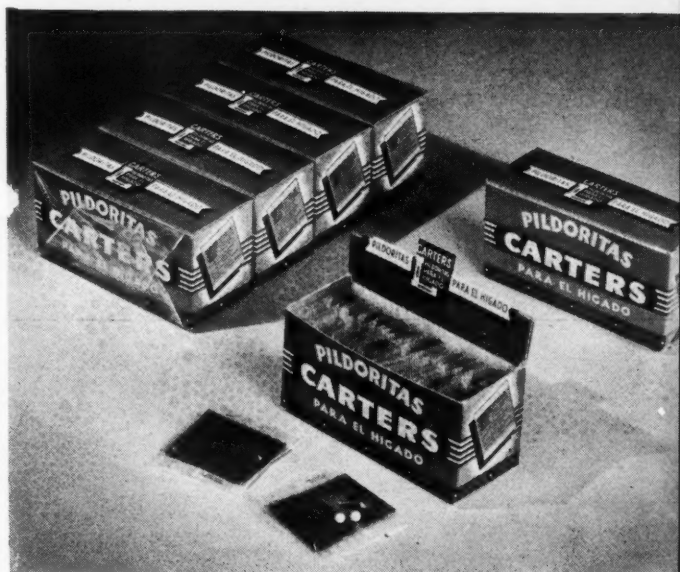
While one group of exporters is being tempted by the opportunities of Latin America, others are looking into the potentialities of the still untouched hinterlands of the Far East. More realistic export men with recent experience in China, however, query whether they are looking ten years ahead or fifty.

In 1921, Dr. Sun Yat-sen wrote a book, *The International Development of China*, pointing out the undeveloped interior of China as a vast outlet for surplus productive capacity. For the reconstruction of this area, he outlined major projects concerned with communications, railways, heavy and light industry and mining. Greatest emphasis he placed on communications—100,000 miles of railway, a million miles of hard surfaced highways, canals and river control projects. An indication that he, too, was package conscious was his suggestion for the planning of a river port near Poyang Lake to handle fragile Chinese porcelains produced in Kiangsi with a minimum of transshipment and breakage.

The death of Sun Yat-sen coincided with the beginning of political upheaval in China followed by the present war with Japan. What resources the country had have been turned to the production of military goods. In their despair, the Chinese had nothing much to look forward to but hope for the future. In their hope, they again began planning. In 1941, the Chinese Society of Engineers appointed a committee called "The Sun Yat-sen Memorial Committee," to translate into present terms how much rolling stock, how many automobiles, technicians, how much sanitation and education are required to carry out Sun Yat-sen's plans. Under Generalissimo Chiang, each ministry has been ordered to set up a five-year plan. The requirements of this plan call for such large orders as 25,000 locomotives, 300,000 freight cars, 30,000 passenger cars, 80,000,000 telephones, 325,000 cotton looms, 16,000 woolen looms, 94,000 silk looms—huge power developments, reconstruction of highways that have been destroyed in the war.

For the carrying out of these plans, China is relying on the participation of foreign capital. Such participation is of great significance for American heavy industry. On long-term investment it is possible that China may offer one of the greatest outlets for our surplus postwar production. How

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this will be worked out and how long it will take no one can tell.

Naturally such vast development would be a boom to employment and increased purchasing power of China's 400,000,000 inhabitants. With such increasing purchasing power, there would be created both the desire for larger quantities of consumer goods and the ability to buy them. It is this market that many American exporters are considering in their future plans.

The Chinese like American goods. They are particularly fond of small packages of candies and sweets and will spend their extra coins for such luxuries—even if they can afford them only once a month. That is why the advice to packers of such merchandise is to make their packages small and put them within the reach of the 50,000,000 in China who have surplus purchasing power above subsistence levels.

Small packets of raisins, like the one-cent cartons that used to be on counters throughout the United States, proved an enormous seller for one American company in China.

The Chinese, too, have their consumer preferences which must be watched carefully. For example, one American company used to sell large quantities of tooth powder in glass

jars with gold-colored metal shaker tops. When the beautiful colored plastic tops were developed, the company decided that these should have considerable sales appeal and changed to this type of closure. The new packages went to China. Then one day the New York office got a cable from their agent in Shanghai—"For heaven sake don't send us any more colored tops. Won't sell. Chinese want gold tops."

Of course, the selling of such goods in China will not be without difficulty. For a long time after the war, all imports will be watched carefully by the government to protect local manufacturers. Only the most essential goods will be allowed to enter the country without high import duty. No doubt there will be exceptions and packaging materials and equipment for making and wrapping cigarettes should come in this category. Because of the large demand for cigarettes and the high source of revenue they bring to the Chinese government, favorable trade arrangements may be made for the packaging of such products. The average Chinese does not have sufficient purchasing power to buy an entire pack of 20 cigarettes at once. He usually buys only two or three from a broken package at an outdoor stand. Machinery and packaging supplies which would enable the cigarette manufacturer



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12—Familiar brands packed in Latin American plants. Note small soap-bead envelope—a popular size. 13—At left, Colgate products packed in Cuba. At right, Colgate family as packaged in Mexico.



13

14—In three years Latin American Republics have become creditor nations because of heavy United States purchases of raw materials. In photo, Brazilian tantalite being unloaded in United States from giant Navy plane.



in China to put up a small packet of two or three cigarettes, like those used for sampling in this country, should be a decided sales and distribution asset.

Even today Chinese "guerilla industries" are being developed under the noses of the Japanese. They are making chemical, pharmaceutical and other products under unbelievable difficulties from the crudest of makeshift raw material and apparatus. These enterprises are being financed and given technical aid by Indusco, the American committee in aid of Chinese Industrial Cooperatives. This money is paid back out of the profits of small Chinese industry and reinvested in smaller enterprises. It is from such infant industry as this that future small industry in China will grow. It should be the nucleus of the most immediate market for American goods in China after the war.

China is in serious need of food processing and canning equipment of all kinds. The present famine is said to be not so much the result of food shortage as a lack of food preservation equipment and lack of transportation facilities for getting food from one part of China to another. The only methods of food preservation known in most areas are the primitive ones of sun drying, salting or smoking. Much of the food produced, even though it has to be carried over long distances, could be preserved with modern methods of refrigeration, dehydration and hot processing.

China could use and would open her doors for the entry of considerable equipment of this kind, both now and after the war. It would not have to be new machinery. Obsolete machinery, replaced in the United States plants by improved or higher speed models, would help serve China's needs tremendously. This would provide many Chinese processors with adequate machinery for their purpose at much less cost than new machinery. At the same time, it would offer the American manufacturer an opportunity to dispose of machinery obsolete for his production and thus put him in the market for new American machinery of the latest design to meet high-speed and low-cost production at home.

This same condition might be applied to many packaging operations. One American manufacturer said in normal times, his company buys \$100,000 worth of new machinery a year. It has bought none since 1939. Imagine what this manufacturer will purchase once the war is over and he can buy all the new machinery he wants. This particular com-

pany has for years sent its obsolete equipment to its foreign affiliates. This should not be considered a way to "dump" worn-out equipment. It is simply smart business. The machinery is perfectly good, but may not be the right type or have the proper speed for the production capacity a company must have to keep up with its domestic competitors. In another country, the higher speed production may not be so necessary, or the labor situation may be such that less automatic equipment is desirable.

Machinery manufacturers ordinarily might not favor this means for the disposal of old equipment, since they would rather sell new machines. After the war, however, with many debtor nations operating on shoestring credit, it might be one good way to get the wheels of industry moving. It would take less money to buy the used equipment than new, reserving the postwar "machines-for-making-machines" capacity to fill the orders for new wrappers, fillers, cappers, etc., now piling up. From all indications, it may take some time after the signing of the peace before all these orders can be filled as it is.

Equipment manufacturers doing business in out-of-the-way foreign territory must also be prepared after the war to do good servicing.

Too often in the past, equipment was purchased from a local representative. When the purchaser wanted the equipment serviced, he found the local representative to be in another part of the country where he could not be reached. Or if he did locate him, he would not be able to service the machine for repairs or new parts. One export manager said that he had seen plants in China, where the automatic machinery was shoved in a corner unused and the plant had returned to hand labor because it was too difficult to keep the machines in running order without proper servicing.

Americans will do some trading with India after the war, although the British will probably reserve this for themselves. Large credits are being built up in London in exchange for Britain's purchases of raw materials from India during the war. The fact that American troops have been stationed in India and the friendly attitude of the people of India toward the American soldier, may, however, have some later effect on trade for the United States.

This possibility makes noteworthy a few comments from the *British Glass Packer* (Continued on page 214)



PHOTO COURTESY SUPER MARKET MERCHANDISING

1—Package design must sell the consumer in the highly competitive self-service field of today and tomorrow.

Future trends in distribution

by A. B. Gunnarson*

If the prediction of serious students of postwar America is fulfilled, manufacturers and distributors of this country must be ready when the war ends to market from 35 per cent to 50 per cent more goods and services than were ever made available to the public in any year previously. One authority has estimated that annual retail sales of \$78,000,000,000 will be necessary after the war to provide full employment for workers who will be released from military service and war plants.

To obtain distribution of such an unprecedented volume of goods, it will be necessary to call into play every prewar marketing facility and also to develop additional new merchandizing facilities. The flow of this merchandise into the hands and homes of consumers must be expedited. There must be improvement in every form of sales promotion as well as improvement in the physical handling of the goods during each successive stage of their flow from producer to consumer.

It should be obvious that proper packaging of products can

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contribute much to the attainment of these goals. Products enclosed in attractive packages often sell themselves, thus eliminating entirely promotional efforts of sales clerks; products enclosed in packages especially designed to facilitate easy handling by distributor and consumer alike reduce the amount of effort required for wrapping and delivering. Proper packaging is thus the handmaiden of more efficient distribution.

Manufacturers of consumer goods and the creators of the packages in which goods are marketed thus have the opportunity to make a substantial contribution to our postwar economy. To make the most of this opportunity, they must maintain a constant awareness of changes and developments in retail merchandising methods and in consumer reactions to such changes and developments.

Merchandising methods are changing

Some of the trends and innovations in marketing are even now being disclosed by current events. Over recent years many significant changes in merchandising methods have occurred which, while suspended for the duration, will undoubtedly be revived with increased impetus when the war is over.

One trend that is readily apparent relates to the physical aspects of retail stores. Exteriors and interiors have been modernized and streamlined. Studies of traffic flow through stores have led to rearrangement of aisles and of displays. Self-service has been given wider application. Old materials such as glass have been put to new uses in show windows, display cases and shelving. New materials from the plastic groups have found prominent places in store design. Lighting has been recognized as an essential adjunct of merchandising; new forms of lighting, such as neon and other gaseous devices, have been adapted to general and special uses.

These trends will not be diminished because of the present lack of materials for modernization purposes. On the contrary, the longer the war continues the greater will be the demands for replacement of existing facilities. Thousands upon thousands of merchants are today making plans for better facilities after the war. Many of them are setting aside reserves for financing such new facilities.

Manufacturers of consumer goods who expect to maintain their standing in the market and those who want to develop a wider acceptance of their products cannot afford to disregard the signs of the times. Of course, they must have a satisfactory product and they must develop a method of distribution which will permit the product to be put in the hands of the consumer at the lowest possible price. But an important contributing factor in building a satisfactory volume of sales is the factor of packaging.

Let us examine, therefore, the relationship of packaging to some of the merchandising developments mentioned above. Suppose we begin with self-service as an element influencing packaging.

Self-Service

Self-service has been adapted not only to grocery stores, but it is to be found in such fields as hardware, drugs, variety stores and department stores. Packaged products distributed through such outlets should be designed to meet the requirements of the consumer who must make a decision on the spot as to which of several competitive products should be chosen.

The consumer wants to know what the product is, who makes it, how big a quantity he is getting, what it is made of, how to use it or how it works; he wants a definite idea of its quality so he can make a quick comparison with competing products setting on the shelf beside it. In other words, it is desirable that the package carry a label sufficiently informative to enable the consumer to judge the merits of the product without requiring him to seek further data from a sales clerk.

The above suggestion concerning the desirability for more informative labeling of products is not intended to apply only to products which may be sold at retail by means of self-service devices. Adequate labeling is helpful not only to consumers themselves but to salesmen and store clerks who are expected to have a thorough knowledge of the products they handle.

Store fixtures

The trend in store design which brings displays of merchandise closer to the customer is also apparent in fields which have not adopted self-service. The old-fashioned counter which served as a barrier between customer and shelves of merchandise has been moved forward to permit traffic on both sides, while shelves are now as readily accessible to the customer as to the sales clerk. Customers have more opportunity to get a first-hand familiarity with products on display.

They are not held at an arm's length from merchandise except in fields such as jewelry where certain protective measures are necessary for high-priced lines.

The wider use of glass and mirrors for display devices introduces another important factor for consideration of package designers. More light falls on displays. Mirrors bring reflections of light and of merchandise which is displayed. These factors should not be overlooked.

Modern lighting introduces other problems for package designers. Some of the new types of lighting cause unusual effects on colors. In designing packages requiring printing in colors, consideration should be given not only to the resulting effect when the product is displayed in natural light but also to the effects of artificial lights of various kinds. It is desirable that consumers should be able to identify packages of a particular product under any conditions of lighting.

Television

As postwar progress permits the expansion of television so that it reaches an ever-increasing number of outlets, manufacturers will have the opportunity of showing their products on the receiving screen. The importance of package design—shape, typography and color considered—in facilitating consumer recognition of a product should not be overlooked by those who expect to make extensive use of television for informing the public about their goods and services. While full development of television may not come immediately following the end of the war, the opportunities it will bring should be recognized in plans for developing postwar markets.

Vending machines

Busy and hurrying Americans have accepted coin-operated vending machines as a modern device for permitting quick purchase of many articles at convenient points. The penny-in-a-slot vending machines of a generation ago, which caused wide-eyed wonderment of boys and girls, were the predecessors of a long series of contrivances which were developed to the point where we now can buy candy, gum, cigarettes, postage stamps, fruit, nuts, handkerchiefs and soft drinks by automatic means. And, of course, there is the Automat! The postwar necessity for expanding sales volumes may bring about wider use of vending machines. Products dispensed in such devices require appropriate packaging.

Quick-freezing and dehydration

In the food field the war has accelerated expansion of two important processes which may bring about extraordinary changes in postwar merchandising methods. These are quick-freezing and dehydration.

Fish, vegetables, fruit and meat prepared under quick-freezing processes have found ready acceptance by consumers. A dependable market has been established and wider possibilities await postwar development as delivery and storage facilities are perfected. Frozen products require special types of packages adapted to the conditions under which the goods are marketed. They must stand up under low temperatures and be moisture resistant. They could be improved materially by inclusion of an insulating wrapping which would help to maintain the product in a fully frozen condition while being delivered from the grocer's freezer cabinet to the customer's kitchen.

Dehydration processes have been expanded extensively in recent years as a result of wartime demands from military, lend-lease and relief agencies. A partial list of products available in dehydrated form includes such typical items as milk, soups, potatoes, eggs and (*Continued on page 212*)

Package testing marketwise

by Samuel G. Barton*

The manufacturer who wishes to plan a full-scale professional package design study should really begin with the consumer—consider how the package would be designed if Mrs. Average Consumer herself should retain an eminent designer to outline the specifications for the ideal package with no consideration whatsoever for the problems of the manufacturer.

With such specifications at hand, packaging engineers would be consulted; technicians would eliminate the impractical factors and probably approve two or three basic types—each type representing a practical compromise of the housewife's original set of plans. Next, a good designer could furnish two or three alternate designs which would stand out on retailer's shelves.

Then the designs must be taken into the field. Find out where the product will be exhibited in big stores and little ones. How will it stand out among its competitors? Take designs that will attract and conduct two consumer tests; the first for design preference—the offhand opinion of the consumer—the second, a consumer-use test. Analyze consumer preferences according to economic class, age and the rate of consumption of this type of product. Be sure you award the decision to the package preferred by the people who represent your primary market, the persons who make the decision in the families that are heavy buyers.

Remember that the job of the package is to protect the product; act as a dispensing machine; identify the commodity and identify the brand. In addition to performing one or more of these functions it must also act as a selling agent and give instructions on the use of both the product and the package.

Testing the protective feature

From the consumer's standpoint, protection is the primary function of the package. It must protect the chemical composition, the appearance, against loss by leakage, against climatic conditions and so on.

The consumer may want to know what you do to protect your product on its way to the retail store. This may be an important part of the sales story. Of more direct importance to the consumer, however, is the protection given the product after it leaves the store, during transportation to the place where it is to be consumed or used, while it is stored before use and while in use.

The question of how long the package must stay in the home is an important one for the manufacturer to answer for obviously all families and all people will not consume a product at the same rate during all seasons of the year and different localities will make different demands. The packager must take the severest conditions into consideration: infestation, excess humidity, heat, rust, evaporation, color fading, etc. I would suggest the assistance of a professional research staff where this phase is of major importance, but

feel that a little consumer investigation by your own staff may help to check your own ideas of consumption rates for your present or postwar products. When you have obtained some valid concept of the protection conditions your package must meet, these conditions can be approximated by a competent testing laboratory.

Next come actual consumer tests of two or more packages approved by the laboratory. Ask consumers to use the products for a period of time—many will do it as a favor, more in return for "free merchandise." The best tests obtain a comparison of two or more packages by each tester, with tests either running concurrently in the same home or with the tester fully advised that a second or third package is to be tested later and comparisons requested. We have found it better to use a smaller panel of testers but to compensate each one in addition to the "free merchandise" she is to test in order to get more complete results.

Testing the package as a dispensing device

This rather specialized function is important for many products, among them milk, carbonated beverages, salt, disposable tissues, catsup, dentifrices, cigarettes, cold cereals. The package must not only protect, but must work satisfactorily and continue to function during its life. Consumer testing of the package will help you to avoid an impractical dispensing package and help you in deciding of whether to favor appearance or practicability in a compromise.

Testing unit size

Some of the most obvious points to be considered are that the package be small enough to be stored easily in the average home, small enough for the housewife to carry with her other purchases and inexpensive enough to fit the amount of money that the consumer can lay out from a weekly paycheck. At the same time it must be large enough to be economically packaged, sized to fit the customary shopping frequency pattern and the normal consumption rate, and small enough (or protective enough) to avoid waste through spoilage.

Commodity and brand identification

With more and more business being transacted by self-service, it is essential that the package clearly announce the type of product it contains. A box containing crackers should be plainly labeled. As Mr. L. A. Johnson said at a recent meeting of the New York American Marketing Assn., "The buyer must be reminded to buy crackers first—your particular brand second."

A well-identified brand assists the buyer either in remembering "that's the one I want," or "that's the brand I'll never buy again." Family brand identification can be aided through package design by color, type styles and package shapes. See to it that your new package can be recognized by the consumer as a member of your brand family. Find out if your new package creates a deep and clear impression,

* President, Industrial Surveys Co., Inc.

What would Mrs. Average Consumer want were she able to hire an eminent designer to make her ideal package? Her ideas and desires should be taken into consideration before any manufacturer makes definite plans for his postwar package.



a picture of the label that the consumer can easily visualize in his mind's eye. The relative ability of several packages to do this can be estimated through simple comparison interviews with a small cross section of the customers.

Testing the package as a selling agent

Certainly a great part of its selling job is done if the package clearly identifies the commodity and the brand. But the package can also stimulate a desire to buy regardless of real need for the product especially if it is a dispensing machine. Another important factor, which can be developed tremendously in the postwar era to create brand loyalty and perhaps to step up consumption rate, is the secondary use of the package, for example the beverage glasses in which jelly, cheese and luncheon spreads are packaged and which can be used in the kitchen afterward.

The package itself can sell the ideas of quality, sanitation, purity, etc., and its ability to do so can be tested through consumer interviewing.

A package can frequently sell if, through use of pictures, menus, recipes or suggestions on the label it can answer such questions as "What should I get for dinner tonight?" "What should I get Amy for Valentine's Day?"

Testing the instructions on the package

Closely allied with the idea of selling by providing menus, recipes, etc., is the function of basic instructions in the use of product and package. Research has revealed that few are properly written or illustrated, that most are never read at all, that people still break the turn keys of fish tins or open cracker boxes at the wrong end. The use of good diagrams or pictures, supplemented by short visible copy has been found best.

Instruction can be tested easily, but requires that a cross section of potential consumers make the test. The investigator notes the testers' mistakes in following directions, discusses the directions with the tester to find out where they are unclear.

The informative label on a package should report only the facts, but they must be understood. This can be facilitated through testing the wording, but may well require supplemental education through general advertising.

Testing consumer storage facilities

Most manufacturers would do well to know more about the facilities which consumers have for storing his commodities. What proportion of the users of his commodities would find it inconvenient to store a package 8 in. high? 9 in.? 11 in.? For some products it would be well to know, along with the average consumer storage facilities, the range of average humidity and temperature in consumer storage cabinets as well as possible hazards due to discrepancies in equipment.

Package design research with your own staff

Many large corporations have extensive research staffs and budget as much or more for market research as they do for product research thereby avoiding many flagrant marketing and packaging errors.

Every manufacturer should have a consumer research department. If necessary, it can start out as a one-man affair. A good basic research unit would: (1) collect, analyze and digest outside research studies; (2) abstract pertinent data; (3) represent the consumer's point of view in any management meeting; (4) conduct small-scale field surveys where a few hundred local consumer interviews would assist in answering the marketing problem as protection against any flagrant marketing or packaging errors; (5) plan, pre-test and direct full scale professional surveys; (6) analyze and interpret any continuing research services to which the company might subscribe.

Including the services of a \$5,000-\$10,000 a year research director, a librarian-secretary, a statistician-chartist, two interviewer clerks and operating expenses, the annual budget for such a basic research department would range from \$11,500 to \$18,800. Such a department, if staffed with versatile people, could handle practically (Continued on page 212)

POSTWAR DESIGN

"in work"

by Raymond Loewy*

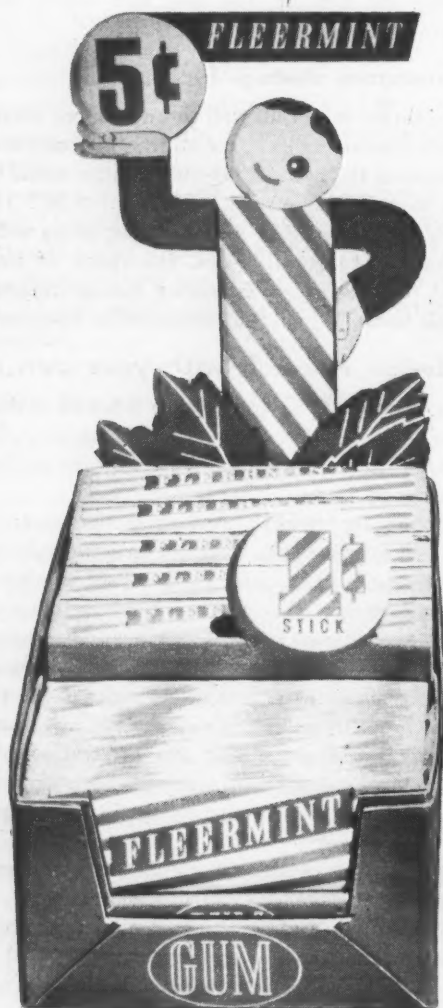
Because the term "postwar" has been applied recklessly to a variety of impractical design fancies, it should be used advisedly in connection with package design. There is nothing either impractical or remote about postwar package design. In relation to time, postwar packaging is the business of today; as for flights of fancy, the package designer is too busy to indulge in them. At the moment, however, one legitimate connotation has been added to the word "postwar," and that is "confidential." Specific plans are being guarded as jealously as war secrets, which they are, in fact, to the manufacturer.

For the past two years, the designer's report to the packaging industry has boiled down to discussions of expediency—the substitution of materials, the development of potentially useful techniques. Today's report reveals that the period of designing emergency packages is tapering off. With eyes to the future and nose to the drafting board, preparations are being made for better-than-normal packaging programs.

* Industrial Designer

Much will be salvaged from war packaging methods that will benefit the industry, but the temptation to over-estimate the number of valuable lessons learned and techniques accumulated must be resisted. Try as we may to find virtue in some wartime expedients, some will be sloughed off with the emergency that necessitated them, and no tears shed. What we have learned that is good is already being applied to peacetime design.

Packaging under war conditions, if it produced no other benefit, has broken down many a manufacturer's innate resistance to change. True, emergency packaging brought this about the "hard way," but the break having been made many products will emerge in improved costume after the war. More than this, a great many hitherto unpackaged items are being treated. The fact that sales might be affected by unfamiliar packages for established products has been a manufacturer's chief argument against modernizing his package. Change in itself is not an unmitigated virtue, unless it is change for the better. There will be a great many



"In relation to time, postwar packaging is the business of today," says Mr. Loewy. 1—This wartime package and display for Fleermint gum, designed in 1942, will be continued after the war. 2—Paper lipstick containers are a real war baby of good design; future uncertain.



manufacturers who can return without apology to prewar packages, providing machinery is available, and other economic considerations justify the resumption of prewar production methods.

While the exact number of packaging techniques which might be considered improvements during the past two years is debatable, there can be no question about some. Particularly in the case of prepacking complicated tools, machinery or other durable goods, great strides have been taken. Food packaging for overseas shipment also has added much to sound packaging practice. In these instances representing only two of many, the war provided a vast laboratory for testing deficiencies in packing techniques under extreme conditions. Over-packaging and under-protection were major evils when shipping space was limited and costly. The designer, with new products to package and familiar products to launch again, will make use of every device that war packaging has used successfully.

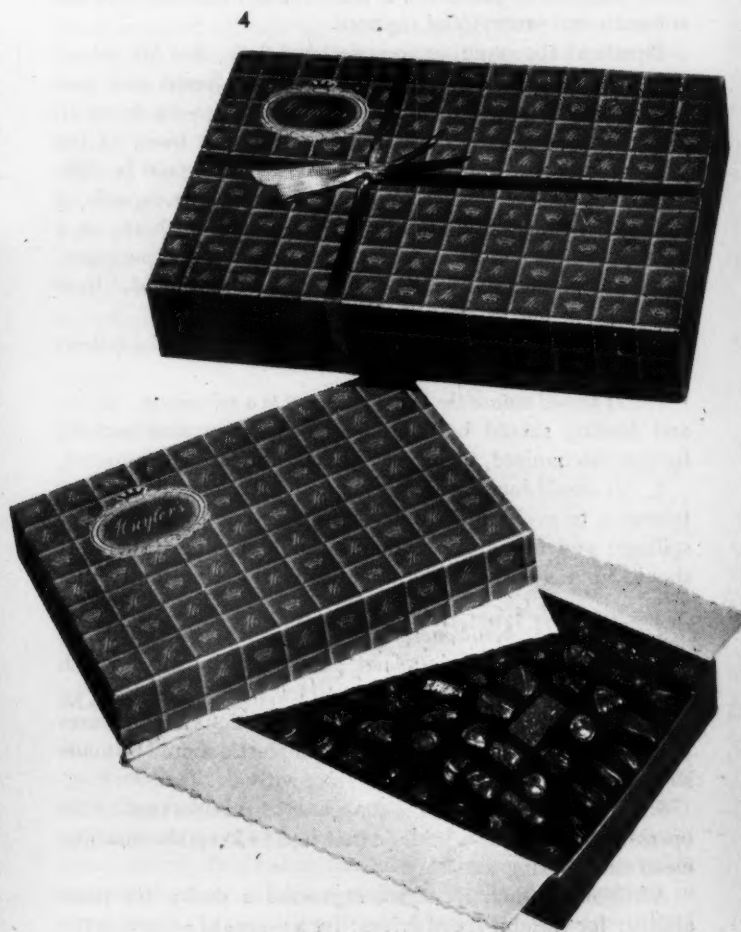
Perhaps the most conspicuous new feature of the postwar packaging field at the moment is the increase in its size and scope. Now as never before, manufacturers are design-conscious. They expect markets to be expanded; there are new competitors in every field; products which were never packaged before are being prepared for sale the world over. Transportation facilities having been increased, merchandising assumes international proportions. The American military has opened new markets abroad; new tastes

are being developed in countries which never before had access to America-made products. Packages with limited regional appeal are ruled out of these markets. Design of universal appeal must replace them.

Using the techniques, materials—and there have been some—and the psychological advantages that war has produced, the designer's work for postwar packaging continues in the direction of eliminating old evils. Most prevalent of these has been over-packaging—the whimsical American practice of putting powder into a metal container, wrapping this in cellophane, placing it in an outer container of cardboard, wrapping this and successively labeling each. In this not-too-exaggerated instance, both over-packaging and over-protection find example. In order to make a package appealing and economical the designer must know exactly where to call a stop. Over-packaging, over or under-protection, the use of too much strong color, over-insistence on legibility at the cost of attractiveness are forms of excess which careful package design attempts to prevent.

Beginning again after the war, package design will be dedicated to making a product as attractive at the point of sale as it is at the point of use or vice versa. For example, it has been seen that often the color of a liquid in a bottle is its most attractive feature. Concealing this bottle, then, in a container eliminates a potential selling feature. Unless the outer container is necessary in shipping or for protection, it would seem that the (Continued on page 210)

3—Pepsodent plans to continue these tooth brush packages, Loewy-designed in prewar 1941. 4—When Hyler's introduced this candy box as part of its coordinated merchandising plan in 1942, the package was planned with an eye to wartime adaptations as necessary.





Packaging machinery changes ranging from improvements to "revolutionary" new models are on the drawing boards and will be released as rapidly as war conditions permit.

This is the consensus of information from leading equipment manufacturers in response to the challenge from L. W. Kendrick, chief engineer of The Carter's Ink Co., who in his article "An Engineer Speaks for the Future," in the December issue of *Modern Packaging*, outlined features which he as a packager hoped to find in his postwar machinery.

Response to Mr. Kendrick's article—which was deliberately planned to bring out a well-rounded discussion of the subject—was prompt and vigorous.

Nearly all the manufacturers declared flatly that Mr. Kendrick's idealistic objectives are attainable. Some said that they have already been attained and pointed to machines already in operation which incorporate some or many of the desired features. But it was conceded that it would be difficult to put all of the features into one machine capable of handling small packages or large, long runs or short—at a price which would be practical for the average packager. Most manufacturers felt that it was just a question of, "How much is he willing to pay for these things?"

It will be recalled that Mr. Kendrick presented the following outline of the ideal machine:

1. *It should reduce the human element to a minimum.* Setup and feeding should be simplified; inspection and packing further mechanized, the chore of hand lubricating eliminated.
2. *It should have a maximum output.* It should have wider tolerance to avoid unnecessary stoppages due to breakage or spillage, and cleanup after spills should be facilitated. It should have a means of automatically rejecting faulty material.
3. *It should operate normally throughout its life.* Quality and speed of output should not be affected by wear, which should be automatically compensated for.
4. *It should be safe to operate.* Limitations of pressures would help, and guards of transparent plastic should be made so that the machine would not operate without them.
5. *It should look its best.* Appearance is important to the operator's morale, and pride impels him to keep the machine clean and working smoothly.

Additionally, Mr. Kendrick expressed a desire for portability; for variable speed drives; for a means of adjusting the working height; for built-in automatic shutoffs with tell-tales to stop the machine when something goes wrong; for "change"

parts that can be installed by the operator, and for "junior" editions of current machines engineered specifically to handle small bottles from $\frac{1}{4}$ to 2 oz.

Here are typical replies from manufacturers of equipment:

Manufacturer A

Mr. Kendrick's objectives are attainable, and, as a matter of fact, there is equipment on the market that would fill some of his needs or could be adapted to his needs. Just as it is impossible for any one machinery user to be fully informed about all of the equipment that is available, it is also impossible for any machinery manufacturer to get his message across to all of the potential users of his equipment. It is quite often the case that a production man acquainted with the procedure and practice in his field may not be aware that some packaging machine built for an entirely different purpose has features that could be adopted for his use.

It should also be pointed out that some features mentioned by Mr. Kendrick as being ideal from a standpoint of glass only, can be furnished, although at an extra cost and possibly at the sacrifice of versatility. For example, change parts which require a minimum amount of judgment on the part of the operator and maintenance force can be provided for specific containers, although to attempt to adjust them to fit a large variety of sizes of containers without provision for additional expensive change parts would not be practical.

It is entirely possible that there is need for an automatic machine design especially for small containers. Until the present, our experience has been that the demand for high-speed automatic filling equipment was primarily for quarts and pint bottles and that the runs of small containers were relatively short and did not justify a separate production line.

Manufacturer B

We think that the point of perfecting a machine so that it will operate normally throughout its life is a very good one, and one which will tend toward the use of more anti-friction bearings, perhaps, rather than oil bushings.

Manufacturer C

All of Mr. Kendrick's objectives are attainable. There is nothing in any of his points which should cause any serious difficulty for us machine designers, primarily because many of them are already now incorporated in packaging machines.

Secondly, it must be borne in mind that machine designers must always be two or three steps ahead of the consumer otherwise no new types of machines would be built.

In his article Mr. Kendrick speaks primarily of bottle filling and bottle handling, which constitutes only a small part of packaging equipment. The packaging of brittle objects, or the handling of such products as cigarettes or cigars, presents difficulties which are at least as troublesome as those mentioned, if not more so.

The maximum output, of course, depends on the filling speed. I do not believe any packaging machine today is operated at its maximum mechanical speed and the only way to get maximum output corresponding to the maximum mechanical speed is to use multiple fillers. Many such multiple filling devices are in use today, but you will always find them where there is a question of frequent changing from one size to another.

One other difficulty in obtaining maximum output is that if we have manual feeding, the speed of the machine must correspond to the optimum speed of the feeder or feeders.

Manufacturer D

We believe that Mr. Kendrick's objectives are attainable, if not totally, to a very great percentage. Improvement of a machine system should be the goal that every manufacturer aims for.

We have plenty on the drawing boards trying to meet his requirements, but how much of it can be accomplished in postwar depends upon the length of time the war will continue.

Manufacturer E

I think, in general, Mr. Kendrick's objectives are attainable. Advances have been made in types of equipment which involve kick-out mechanisms, where the material to be handled is defective. This eliminates breakages, but does cause a stoppage of the production flow.

On this subject, I think a good deal more could be done by the manufacturers of containers to throw out over- or under-size packages before they reach machine handling. The buyer should be willing to pay a premium for such service, provided it were adequately performed. It would surely reduce production interruptions, due to stoppages, breakages, and cleanups.

Hand-wheel changes and adjustments are now common and practical. Gages are set on machines for this type of change-over device, and charts are furnished to set the machine to handle each particular size.

I think many designers have gone to extremes in so-called "streamlining" equipment. Much of this is done to cover up moving parts, but almost invariably this also means covering up lubrication points. I know of cases where builders of machinery have been called on to cover up their equipment in order to have it present a smooth appearance, but shortly after its installation, these shields were removed and thrown away, never to be used again. A good deal, though, can be done in the design of frames to eliminate dust catchers and other protuberances, and the smart machine designer will strive for a happy medium.

Manufacturer F

I agree with Mr. Kendrick's ideas and I think they are attainable based on the knowledge I have of the label paster field. We now have on the drawing board a new model label paster

which will be revolutionary over the present type of labelers.

Manufacturer G

Some of the points brought out by Mr. Kendrick's article might as well be applied to packaging machines involving the use of paper as to the products about which Mr. Kendrick was writing. As a matter of fact, every single point brought out by Mr. Kendrick can be applied to improvements which should be made in all types of packaging equipment that we are familiar with.

In my opinion, the first point he brings out, "reducing the human element to a minimum," is the most important because so many of the machines now being used get out of adjustment very easily and then require the services of an expert mechanic, whereas they might be designed so that adjustments could be made by the machine operator. More recently designed packaging machines, I think, have a definite trend in that direction.

If this point were emphasized it would follow that the machine would "operate normally throughout its life" because with proper supervision the operator could make the adjustments which would keep the machine in proper running order. I think it might be added that the machine should be flexible both as to changing to accommodate different sizes of packages within a given range and also be flexible enough to handle different types of material.

A year or so ago we made a rather thorough study of bread-wrapping machines in use and our engineer who happened to be studying that particular problem felt that fairly simple changes could be made in the design of the bread-wrapping machine so that the operator could change the plate from those required for sealing wax papers to those required for sealing cellophane in a very few minutes; whereas a baker who now operates a single machine for both types of packaging material has a long tedious job of cleaning up the sealing unit to change from wax paper to cellophane. Some fairly simple changes could be made so that the existing machines could handle products other than the wax paper for which they were originally designed much more satisfactorily than at present.

It seems to me that some of the manufacturers of packaging equipment should work more closely with manufacturers and converters of the packaging materials in bringing out new models.

Manufacturer H

In general, I think Mr. Kendrick's objectives are attainable, although some of them may be a little too ideal. He says fillers, cappers, etc., should require no operator attention whatsoever during a run except for feeding the magazines occasionally. That would be very nice, but we have always contended that any automatic machine requires an attendant to be there and keep an eye on it.

Manufacturer I

Mr. Kendrick is talking primarily about glass packaging machinery which we do not manufacture. But we do feel that there unquestionably is room for improvement in many of the packaging machines now on the market (including our own), and needless to say, our engineers are actively engaged in redesigning some machines and in designing new machines in some cases for handling dry products in packages—all of which we will announce in due time when we are able to return to our own manufacturing.

PACKAGING LESSONS LEARNED FROM THE WAR



1—The V-box is an outstanding contribution of World War II to the shipping container industry.

by J. D. Malcolmson*

Will V-boxes still be used after the war? Will paint still be packed in paper cans? Will outer pliofilm bags still be used to keep moisture away from valuable metal instruments? Will coffee go back to vacuum cans? I don't know, but most people will doubtless agree that many packages and containers will be permanently influenced by the war.

In no previous war has so much thought ever been focused on packages and containers and in no similar period of peacetime history have so many new packaging methods been developed. War at best is a sorry business, but we can at least take a cold-blooded attitude towards these packaging developments and consider which of them can be salvaged for postwar civilian use. Unquestionably a great many of these developments will persist after the war.

Under the forced draft of wartime needs and the Government's almost unlimited purchasing power, the packaging industry has developed many new containers which they never dreamed of before and utilized still others that had been known but not explored because of their ridiculously high cost by peacetime standards. The most important thing in war is to deliver the goods, cost being secondary. For that reason some of today's extravagant packages will unquestionably sink without trace on V-day, but there are others which will pay off on the boldness that only war could have justified.

No less important are the experiences with "substitutes" which have been forced on shippers, particularly shippers of civilian merchandise, because of wartime shortages of critical materials. In many other instances containers have been

made of the old materials, but with much smaller proportions of the more critical components. Thus we have learned to produce tin cans with less tinplate than was ever thought possible and high-test fibre containers with a minimum of new kraft pulp. Many industries have also been compelled to experiment with substitute container materials that they never would have even considered in normal times. This really has been a very healthy experience, however, as nearly every such shipper now has first-hand experience with quite a long list of packaging materials. Some he will retain after the war and in any event he has at least been forced to jettison old prejudices which may have prevented him in the past from trying all the possibilities.

Industry can also take pride in the superlative job that its specialists have accomplished in the war effort. The armed forces have been quick to grant commissions or important civilian assignments to these men, so that today the Government is finding that good packaging engineers are strictly on the critical list. After the war, these men will bring back to industry a wealth of experience and knowledge that could never otherwise have been accumulated in so short a time.

We are all familiar with the progressive "substitute steps" that have been forced on packaging. A typical series is from tin to glass with rubber gaskets, then to glass with paper closures and no rubber, and finally to paper cans or cartons treated in a variety of ways. At first paper was the universal "catch-all" beyond which there were no further substitutes, and for a while it seemed that there would be plenty of paper and paperboard to fall back on. But eventually even these materials became critical, so that many top priority industries

* Technical Director, Robert Gair Co., Inc.

have literally had to curtail production for lack of, say, corrugated or solid-fibre containers for their merchandise.

In spite of the sudden prosperity, the paper and paper-board industries refused to act the part of a tonnage reservoir only, and instead have developed a wide range of new products such as V-board, high wet-strength papers, grease- and moistureproof papers and other products which have often started out as substitutes, but finally have come into their own as valuable new packaging materials. Some of these are bound to persist after the war.

V-board started out as a very expensive sheet (especially in the V-1-S grade) and was difficult to manufacture, control and hold up to specifications. However, all of the producers of corrugated and solid-fibre V-board—in a remarkable, patriotic gesture—quickly perfected arrangements to pool all of their technical discoveries and improvements. This has worked out so well that today there are 30 or 40 producers of V-boxes equipped to make V-1, V-2, V-3 as well as various grades of special weatherproof items such as 2½-hour immersion board and board of lower test as illustrated by the TNT and 5-in-1 ration boxes. Improved technical knowledge and large-scale production experience have also resulted in the development of quite an assortment of waterproof adhesives for use in the combining process. These include urea-formaldehyde resin, polyvinyl products, asphalt and combinations of these with various starches and catalysts. Some of these newly developed compounds go under such trade names as "DuPont 77," "Uformite," "Bitusize" and the like. In addition to that, the adhesive manufacturers have produced an array of waterproof adhesives for sealing flaps. This is all the more remarkable when it is considered that most of these adhesives are applied with a water vehicle to a board deliberately designed to resist water, yet when the adhesive has set it becomes waterproof.

Perhaps this would be a good place to define weatherproof or V-board. It is a board of relatively high Mullen test that will withstand prolonged immersion in water without disintegrating. Many people still think that the term "weatherproof" indicates a box that will keep water away from the contents, but it cannot be emphasized too forcibly that this simply is not the case inasmuch as most weatherproof boxes

have quite a hole in each corner through which water can enter. The Marine Corps favors a V-1-M box which keeps the contents dry, but in this case they use a regular weatherproof container and seal up all the seams and corners with a very high grade of pressure-sensitive tape. If it is desired to keep moisture and water away from the contents in a paper package, it is necessary to follow the method used by the Marines, to use a heat-sealed waterproof bag inside the box or to dip the sealed box in molten wax. It should also be pointed out that prolonged immersion of V-board injures its rigidity



2—Time and labor saving by Navy method of palletizing. 3—Waterproof packs developed by Quartermaster Corps for the Army's Ration K units.



4—Dehydration-pliofilm pack eliminates old-time greasing.

quite considerably (though not as much as in the case of ordinary board). As a result V-boxes should not be depended upon to protect fragile merchandise or contents which do not completely fill the box when stacked for prolonged periods under abnormally damp conditions. Here is one problem that the war has not yet solved: the development of high wet-rigidity board. Let us hope that it will not take another war to produce this very desirable characteristic!

The fibre container industry searched for 30 years for treatment which would prevent its board from disintegrating when wet. The problem seemed difficult enough in the case of solid fibre, but it was considered absolutely impossible of solution for corrugated since when corrugated board is immersed, the water flows into all the flutes and comes into very intimate contact with the tiny strip of adhesive along the tip of each flute. Yet today, a great many box makers are producing corrugated V-board that will withstand a great deal more than 24-hour immersion in plain or salt water without any appreciable separation of the liner from the corrugations. It is therefore reasonable to suppose that after the war there will be many uses for corrugated and solid-fibre V-board, though the annual tonnage will not be as large as it is now. One obvious field is for export shipments where the boxes are exposed to the dampness of sea air and ship holds. Today most of the Lend-Lease V-boxes are going to Europe, but after the war it is greatly to be hoped that American business will attempt to retain a considerable portion of the South American trade we now enjoy, but which in normal times usually goes to Great Britain and Germany. Let us hope that V-boxes, because of their lighter weight and requirement of less cargo space, may contribute to our postwar business.

An incidental development in the intensive study of weatherproof containers has been the subject of tin can corrosion and its cure. This was covered very thoroughly in the December 1943 issue of MODERN PACKAGING.

In the paper industry there have been dozens of new special papers developed to meet Government specifications, chiefly from the Ordnance Department. These papers include greaseproof, waterproof, corrosion-prevention and high wet-strength characteristics. They will remain after the war.

On the subject of export containers, we should not forget that the war has given an enormous impetus to air transport and the development of suitable containers for shipment by air. Here light weight and minimum space occupancy are the most important factors. It is true that today the greatest tonnage is moving over the Army Air Transport Command and Navy Air Transport Service. Nevertheless, when the war is over, we are going to see an enormous increase in air freight so that the things we are now learning about lightweight containers will then be available for civilian shipments.

Referring again to water and moistureproof containers, a very interesting development has been the small arms ammunition package first developed by the Frankford Arsenal and the various waterproof ration packages. Prior to this war, small arms ammunition has always been packaged in soldered tin boxes. Soldering makes a questionable seal inasmuch as its entire efficiency depends upon the skill of the operator. Then when tin became critical, the Arsenal was faced with the problem of finding, if possible, a better package than the tin box. The problem was solved so completely that most of the arsenals are now using the new package and it is doubtful whether they will ever go back to the tin box. This new method of packing consists essentially of a very accurately constructed folding carton which, when sealed with waterproof glue, is practically airtight. It is then automatically passed through two baths of specially blended wax, the first bath being at a higher temperature than the second. The first immersion causes the hot wax to penetrate $\frac{2}{3}$ through the walls of the box, and the second dip in the cooler wax seals up any remaining pinholes or blowholes. Tests of the most exhaustive nature, including tumbling in the surf, have demonstrated that this package has a smaller percentage of failures than the previous one. The same method of packing has also been applied to Ration K, 5-in-1 ration and other items. It is true that the wax is expensive, and for that reason this method of packing will not necessarily compete with tin after the war. We should not forget, however, that Cracker-Jack and some other items have been packed in this manner for many years. Another form of wax dipping that offers great possibilities for the future is the wrapping of highly polished metal parts with paper wrapped tightly around the part, after which the entire item is dipped in wax. This not only prevents corrosion under the most severe conditions, but makes the part immediately available by simply stripping off the paper. The older method was to cover the part with a heavy coating of cosmoline or other grease which took a tremendously long time to remove, particularly when applied to the intricate mechanism of a rifle. Another method of packing such items as rifles and small mechanisms is to heat-seal them in a treated paper sleeve or bag. Beyond question these new packaging developments will persist after the war because they are more economical than the previous methods.

Perhaps the most spectacular package developed by the war is the laminated heat-sealed pliofilm bag which encases a complete aircraft engine and also gives visible indication of any leaks by the change in color of a "tell tale." While this

aircraft engine bag may possibly be too expensive for peacetime use, this theory of protection against moisture will undoubtedly have many postwar applications.

Another interesting moistureproof package made of paper is the cylindrical two-piece container for artillery shells. The joint between the two pieces is sealed with waterproof pressure-sensitive tape, and almost every newspaper or magazine carries pictures of our artillery firing in foreign lands with a pile of these empty shell cases in the foreground. Here again the Government specification results in a very expensive package, but some modification of this idea is bound to have considerable use after the war. The same idea is being used on a smaller scale by the Medical Department for the packaging of field medicines and other medical equipment. In some such cases these paper tubes are fitted with interior corrugated cushions to prevent breakage.

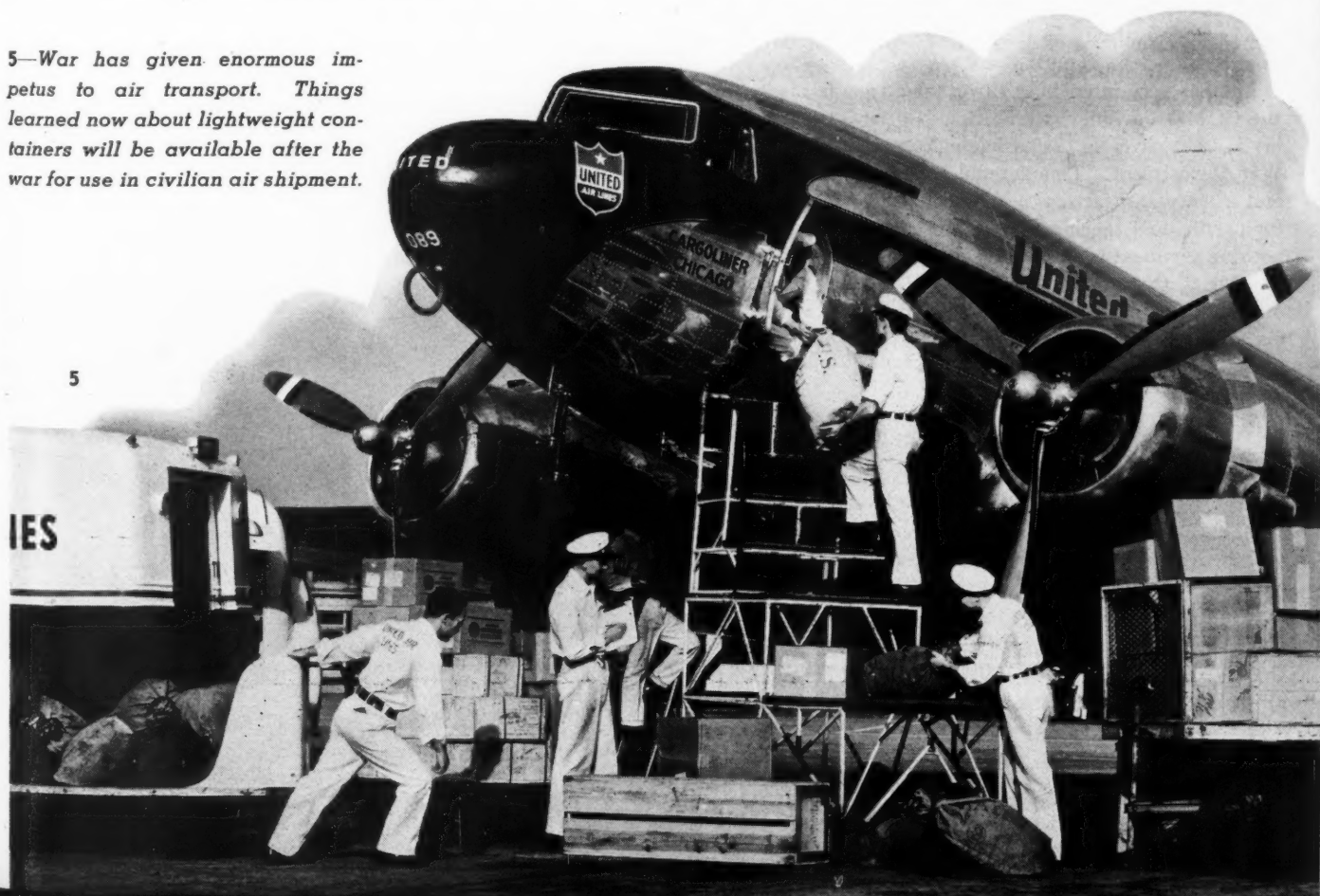
One of the most interesting packaging developments, due entirely to the war and undoubtedly to be adapted to postwar civilian needs, is the handling of clothing containers by the Brooklyn Naval Clothing Depot under the supervision of Capt. Chas. D. Kirk, Lt. (jg), Walter T. Sheldon and others. This is almost a perfect example of clean-cut thinking in the handling of enormous quantities of packaged clothing and other merchandise. They started out by dividing up the floor area of a box car into sections approximately 4 ft. by 4 ft. They then secured a large quantity of standard pallets each 4 ft. by 4 ft., and from that area they worked out standard lengths and widths of the containers so that they would fit exactly on this pallet. Larger size boxes were produced by increasing the top to bottom dimension, and smaller containers were created by cutting this last dimension in halves and quarters. This means that a pallet can be loaded with an assortment of container sizes and still come out almost a perfect cube. The complete load is then metal strapped to the pallet which means that a fork truck can pick these loads up, move them around, and stack them at almost unbelievable

speeds both on the warehouse floor and in the freight car. For example, under the old method of handling containers one at a time, it often took 14 men half a day to load one car, whereas under the new system the same car can now be loaded by one operator in less than two hours. Even more significant is the fact that this operator is usually a woman. This system also means that the contractor can load and strap the pallets right in his own factory since they are carried by truck or freight car to the depot. At that point they are either put into storage or are often reconsigned to some other depot. The savings are even more impressive when it is realized that the Brooklyn depot alone often handles over 1,000,000 garments a day, and that its weekly freight traffic averages over 1,000 cars and trucks. In fact, this one depot is probably the largest clothing establishment in the world today. This simple and utterly sensible method of handling freight and designing containers will simply have to be copied by civilian industry after the war.

One of the most valuable assets that will accrue to the civilian postwar industry is the very complete set of container specifications which the various Government branches have developed. We must admit that in the early days of the war some of the container specifications emanating from Washington were highly impractical and even in some instances contradictory. Later, however, experienced container men were inducted into the various Government branches and they quickly started to produce specifications, some of which are models of their kind. In the fibre container industry, at least, we have had very few detailed container specifications and most of these had been produced by some of the larger buyers.

Perhaps the first and most satisfactory container specification from Washington was OQMG 93, issued by the Quartermaster Department to describe the manufacture of V-boxes. This particular specification has met the test of time and today it remains a model of its kind. Not only does it give complete and accurate details covering every phase of materials

5—War has given enormous impetus to air transport. Things learned now about lightweight containers will be available after the war for use in civilian air shipment.





6

6—High wet-strength imparts new properties to paper.

and box manufacturing methods, but at the same time it omits all extraneous matter that has little or no interest to the box maker or the box user. The drawings accompanying this specification are simply perfect and there is no excuse for anyone misconstruing any portion of the document. Proof of these statements is found in the fact that later this specification was reproduced almost literally in a great many later government releases including the Army and Navy Manual, Army No. 100-14A and Navy No. 39P16a; the Lend-Lease Specification FSC-1742-C; the Navy Department Specification 53-B-11; the Medical Department Specification 1635-B and others.

Another very interesting Government manual is known as the OQMG Packing Specification No. GS-1, dated December 1, 1942, covering the packaging of general supplies for the War Department. This manual is issued in loose leaf form and is very satisfactory because of the extreme brevity of each individual specification and because at the same time nothing pertinent is omitted. One reason that this brevity is possible is that the manual was issued after many of the other fundamental specifications had already been stabilized; instead of a complete description of an individual box or its components, it was only necessary to refer by number to the one or more existing Federal specifications involved.

Another worry that container manufacturers had in the early days of the war was the fact that every Government department started issuing its own specifications; before long we had to wade through literally hundreds of them. For example, we know of one soap manufacturer who received orders for an identical brand of cake soap from the Army, the Navy and the Marine Corps. In each case, he had to pack this soap differently to meet the specific regulations involved. Fortunately, this situation did not last long, because a small group of very hard-working container specialists in WPB and other departments got busy and produced a 200-page manual which can be looked on as a sort of "master specification." This manual, which has enjoyed wide publicity and circulation, is known as the "Army-Navy General Specification for

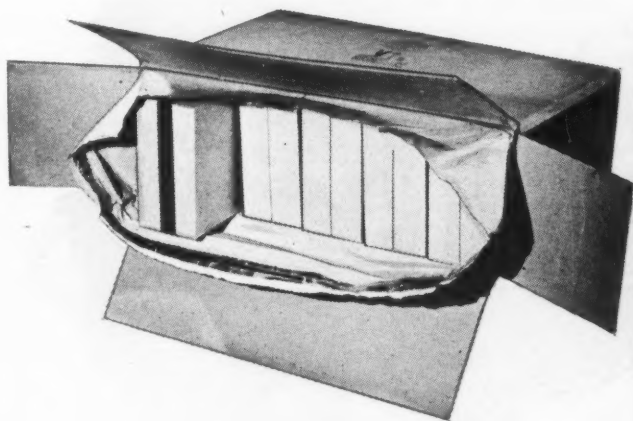
Packaging and Packing for Overseas Shipment" and carries the number 100-14A for the Army and 39P16a for the Navy. In addition to that, the manual has also been accepted by the Department of Agriculture, the Treasury Department, the WPB, the Lend-Lease Administration, the War Shipping Administration and the ODT. This little masterpiece covers practically every form of shipping container and packing material from wooden boxes of all sorts right down to grease-proof paper and non-test corrugated board for interior packing. There is no question but that it will find a permanent place in postwar civilian packaging libraries and it is to be hoped that in those happy days the purchasers of high-test shipping containers will conform to the details of this manual rather than attempt to create their own container specification. The efficiency and economies of manufacturing containers to uniform specifications for a large list of customers are certainly great enough to warrant well the time and work that were used in creating this manual. We all like to make fun of the Government for red tape and unnecessary use of involved phrases and clauses, but we must admit that when it comes to these latest specifications, the Government has done an excellent job.

Another valuable contribution that the Government has made to specifications is the excellent work of the Chicago Quartermaster Department. Not only has this depot produced a long list of very excellent specifications, but it operates a very comprehensive laboratory in which every point is tested and proved before it is incorporated into a written specification. Moreover the personnel of this laboratory is very open-minded to suggestions for improvement and seems to be glad at all times to consult with industry in order to produce a specification that is fair to everyone concerned.

Thus peacetime reconversion will witness many adaptations of wartime developments in the packaging industry and civilian goods will be better packed because of these ingenious innovations. This applies not only to such spectacular new materials as the laminated heat-sealed pliofilm now used to encase an entire airplane engine and the corrugated and solid-fibre V-boards valuable for light weight, strength space-saving qualities, but also to developments in sizes and shapes of packages to simplify shipping problems.

7—Waterproof medical packs were developed for Army use.

7



PAPER CAN FROM DOWN UNDER

1—Australia makes neat convolute paper cans by curling ends of sidewall and pressing between two glued discs. 2—Lipstick holder made in same way.



1



2

Sydney, Australia,
14th December, 1943

The Editor,
MODERN PACKAGING

Dear Sir:

Enclosed please find a sample of a container which we have evolved and find strong, cheap, neat and durable, and which we think may be of value to your war effort in the U. S. A. . . . We have taken no protection on the idea and do not intend to, and any of your friends are welcome to use it—gratis. Furthermore, we will be pleased to give them any information they desire. . . .

Thus to MODERN PACKAGING last month came, from a far-away subscriber, one of the most interesting paper packages that the war has produced. That the shortage of materials in this country has now come full-circle—and finds packagers who turned from metal to paper now turning back to metal again—detracts little from the value of this suggestion, or from the spirit of United Nations' cooperation in which it is offered.

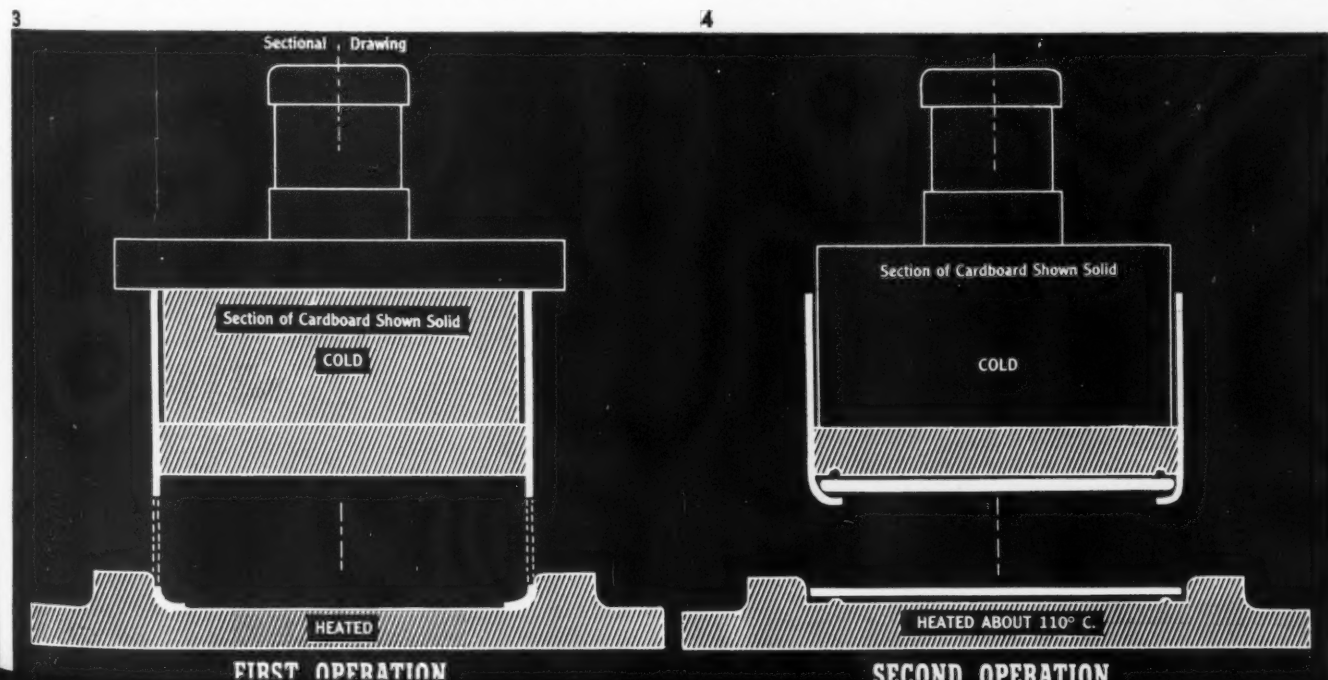
While there can at the moment be no thought of additional conversions to paper, the Australian idea appears worthy of

the attention of that large body of packagers for whom such a paper container remains the most practical medium. As a tubular paperboard container with telescopic closure, it appears to be unusually strong, sound and easily made. It is neat in appearance and has no waste space. It is adaptable not only to the familiar pint and quart bulk containers but also to smaller, decorative packages such as lipstick holders (Fig. 2).

Body of the can and closure are convolutely wound in the conventional manner. The difference is in the affixing of the ends, which makes use of an interesting press-and-die method. The wall of the can is turned in and fixed between two cardboard discs, pre-glued, which form the end. The method is in two operations.

In the first step, the container wall is slipped over the cold top section of a die and butted against a shoulder at the top (Fig. 3). A simple downward pressure into the heated lower portion of the die then accomplishes a preliminary inward curl of the end of the paper cylinder.

The work is then transferred to a second die setup (Fig. 3). One glue-coated paper disc, with the glued side downward, is placed against the bottom of the cylindrical top die and the paper cylinder slipped (Continued on page 220)



3

4



Packaged Permanents

Two good basic merchandising principles were taken into consideration in designing the package for "Eska," a complete, professional, permanent wave kit put up by Turner Hall Corp. The first was to prevent oxidation, therefore the sealed ampules. The second was to help the shop sell the customer, therefore the individual package.

A pastel-colored sleeve box is provided for the three vials which are separated from each other by means of a divider. After the ampules are filled the labeling is printed directly on the glass by means of a steel roller. Each vial is etched at the neck for easy opening and is obviously unrefillable.

The makers of Eska claim that too many beauty shops try to sell a better wave on the basis of a better lotion without having any visual evidence to prove to the customer that a different lotion is really being used. Usually the solutions are in gallon jugs and the operator simply pours out the required amount for the wave into a dish. Eska feels that many more women would invest in a better wave if they had some evidence of the fact that the lotion they were paying for actually was different and better than the cheaper lotions. This package of special shampoo, solution and neutralizer, each in its separate one-time glass vial, they feel, is the answer.

Credit: Carton, Box Specialty Co., Brooklyn, N. Y. Ampules, Kimble Glass Co., Vineland, N. J.

DESIGN

Sales-minded elephant

"Chunky" with all the fixings for a manicure in his superior interior is the latest animal to join the La Cross parade of boudoir bumpkins. The elephant itself is made of plaster of paris in pink or blue. His floppy ears are of felt and he sits on a cardboard base which is cut out to hold a bottle of nail polish, a bottle of base coat, two orange sticks, a roll of absorbent cotton and a real metal nail file. The base for these products is made of two diecut thicknesses of cardboard—the upper one cut to hold the products and slightly smaller than the lower. The five items are held together in a unit by a cardboard band inscribed with the trade name and cut out to hold the orange sticks and nail file upright.

Protection proved to be quite a problem because Chunky is definitely fragile. So, before putting him in his folding cardboard carton he was provided with a protective wrap of creped cellulose wadding.

Along with Chunky the retailer is given a circular display which sets him off to best advantage. This display has a square tab at the bottom which is scored to make a base. If the elephant is set in the spot marked for him on the tab his weight keeps the display erect.

Credit: Molding of plaster of paris, Magnani Statuary Corp., New York. Board base, Barton Press, Newark, N. J. Creped cellulose, Kimberly-Clark Corp., Neenah, Wis. Carton, Wilkato Folding Box Co., Kearny, N. J. Display silk screen, The All Craft Studios, New York.



Sealing films without heat

An important part of packaging a machine gun for the Army so that it will reach the field ready to be loaded and fired is a simple, little lead ring which, when crimped over the end of a moisture-proof Saran envelope (see MODERN PACKAGING, p. 72, July 1943), provides an effective airtight seal. The tubular sheet of transparent plastic which slips over the knitted bag covering the gun is gathered together at one end and slipped through one of these small lead rings which is then crimped tightly together by means of a small hand press without the use of any heat-sealing equipment. An added advantage is that, should it be necessary to re-seal the package after it has once been opened, the ring can be replaced on the plastic and recrimped with a blow from a hammer to produce a satisfactory seal.

Inexpensive and easily handled, this ring helps materially in speeding up safe delivery of machine guns to the military forces. Other Government agencies are investigating the possibilities of using the lead seals for similar applications in other fields. This simple sealing process could also be applied to many items for civilian as well as military use. Its makers claim that it is adaptable to packages of widely varying sizes and articles from watches to machine tools and parts which need protection from air and moisture. Small industries are saved the expense of buying extensive sealing equipment.



Credit: Photos, courtesy Lead Industries Assn., New York.

N HISTORIES

Milk bottle caps

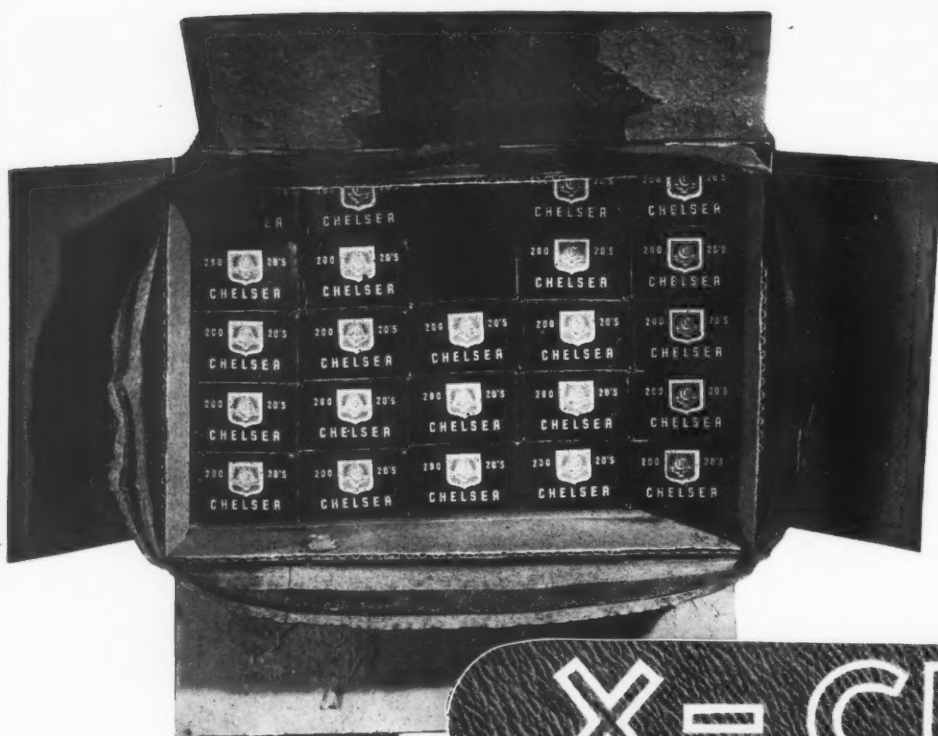
Milk bottle caps may be seen these days on many products other than milk. Manufacturers of a number of products have found these paraffined paper closures to be a satisfactory temporary solution to many metal-closure shortages. Millions of these caps are now being used on foods and other consumer products. They can be produced in a number of diameters on the same machinery simply by a change in the size of the dies used for forming the desired size cap.

Seals are provided for many purposes by the use of a celloseal band. In other cases, the caps are secured to the glass jars by means of what is called a welded wire seal or by means of a crimped steel ring. By the use of a special liner, it is said that these caps are being used quite successfully for the vacuum packing of coffee.

In the accompanying photo is an illustration of one brand of coffee which has been so packed. The use of one of these caps on a shoe polish jar is also an interesting example. The crimped steel ring gives added strength to the paper cap so that by careful usage it may be removed and replaced on the jar the same as a metal closure. These paper caps provide a printing surface for brand identification and informative data on the top of the package. They can also be affixed to almost any jar finish, an advantage when it is difficult to get all glass containers from the same source.



Credit: Standard Cap and Seal Corp., Chicago, Ill.



1—Cigarettes for war fronts have been protected with X-crepe for more than a year. Each shipping container is lined with it. Chelsea was among the first users. At bottom of photo is sample that shows the asphalt adhesive between the plies of the crepe.



X-CREPE

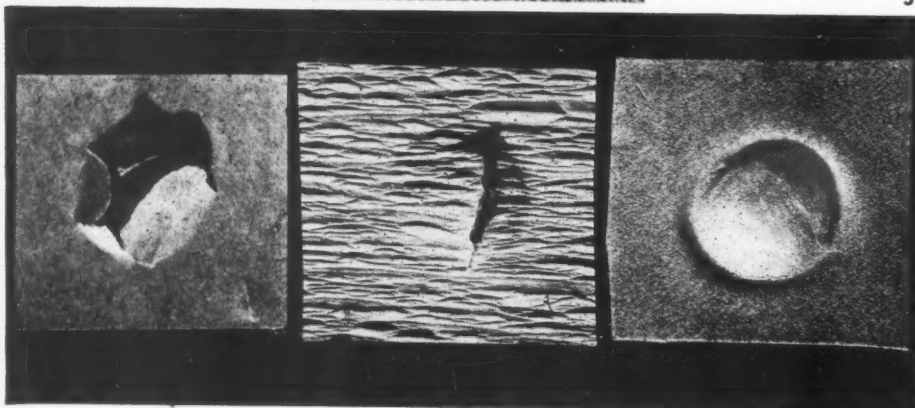
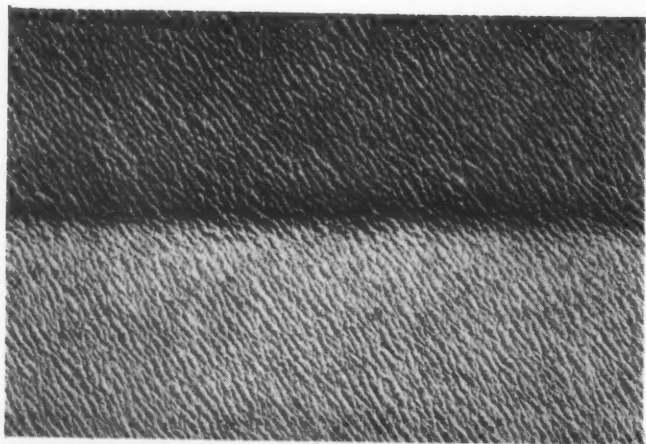
by E. A. Skidmore*

Every great war brings new words to the language. A word that has quickly become a generic term in packaging nomenclature is X-crepe.

In the search for moisture-vaporproof and submersible packages, the material now generally known as asphaltic X-crepe has particular properties to meet the exacting requirements of the armed forces for overseas shipment. These properties are imparted to this laminated sheet by specially developed methods of creping and application of asphaltic adhesives.

The art of creping paper is not new. Paper has been creped on a commercial basis in this country since the beginning of the century. It is a process whereby paper is gathered into small pleats or folds so that when placed under strain the gatherings will unfold and thereby impart stretchability to the paper. Most people are familiar with creped papers for decorative purposes but few realize the important part they have played in our peacetime industrial life and the fact that they are now helping to win the war.

* Vice-president, Cincinnati Industries, Cincinnati, Ohio.



2—X-crepe swatch shows diagonal creping in both directions. 3—Comparison of waterproof paper samples subjected to Mullen test. Left, duplex 30-30-30 uncreped kraft broke in all directions. Center, duplex 30-30-30 kraft creped one way broke in one direction. Right, triplex X-crepe with stretch in all directions did not break.

4—Preforming bag over mandrel.
5—Bottom of bag folded over and ears turned down.
6—Preformed bag in the case ready to be loaded.



4



5



6

how it's made and used

For many years paper was creped or gathered in one direction only, so that it was, in turn, stretchable in only one direction. Likewise for many years it had been accepted as a fact that if, for certain purposes, it was a good thing for paper to be stretchable in one direction, it would be better for many applications if it were stretchable in all directions. To make paper stretchable in all directions, it is necessary that it be gathered or creped in two directions.

In the early thirties two separate and distinct processes were developed for imparting stretchability in all directions to paper. This article will deal with only one of those two processes. This process is known as asphaltic X-creping.

The first step in the manufacturing of asphaltic X-crepe is to coat the plain uncreped paper with a uniform layer of a special high grade asphaltic compound. This provides an unbroken waterproof film. The coated sheet of paper is then cemented to a large creping cylinder, the asphalt acting as the adhesive. The creping blade, instead of being placed parallel to the axis of the creping cylinder as in the ordinary case, is placed diagonally across the face of the creping drum at an angle of approximately 45 degrees. As the cylinder rotates, the creping blade removes the paper and asphalt conjointly from the cylinder and imparts lines of crepe which are, in effect, a series of small pleats in one diagonal, shrinking the sheet both longitudinally and laterally. This operation imparts a high degree of stretchability on the one diagonal but none on the other. It also produces some stretch lengthwise as well as crosswise of the sheet.

The web is then carried on in a continuous operation to a second creping cylinder and cemented to it, using the same asphaltic film as the cementing medium. As this cylinder rotates, the paper again comes in contact with a creping blade which has likewise been placed diagonally across the face of the cylinder but in a position to conjointly crepe the paper and asphalt on the opposite diagonal. This, in turn, imparts stretchability to the second diagonal as well as additional stretch to the length and width of the web.

The above process produces lines of creping on both diagonals which cross in the form of an "X," hence the name X-crepe.

It is important to keep in mind that X-creping contracts the sheet in all dimensions for it is this contraction that gives the finished sheet its stretchability in all directions. Two sheets of this X-creped paper are then combined with the asphalt surfaces together to form a duplex sheet. If greater protection is required, one or more additional plies of the same creped material are added to produce either a 3- or 4-ply material. The result is a material which is not only submersion-proof but also highly impervious to the passage of moisture-vapor. Two-ply X-crepe conforms to Type B, 3-ply to Type H and 4-ply to Type J, "creped in both directions" waterproof paper covered by Federal Specifications UU-P-271a and the Army-Navy manual entitled "General Specifications for Packaging, Packing and Marking."

This sheet is highly impervious to the passage of water or moisture-vapor through the plies. To insure complete protection especially along the cut edges, the paper is treated to prevent water or moisture from wicking along the paper fibres in the seam areas and eventually reaching the contents of the package. A protective all-over antiwick impregnation is applied to each ply of X-crepe to provide this additional safeguard.

The basic asphalt is delivered daily to the company's storage tanks in a hot liquid state. All asphaltic compounds are blended by the company's own processes in its own plant. Temperatures are carefully maintained by automatic controls from the time the asphalt leaves the producer's refinery until it is actually applied to the paper. This is done in some cases by the use of electricity, in others by the use of gas, in still others by steam heat, each having a particular application.

In no case is the asphalt ever permitted to cool to the point where it cannot be readily pumped through heated conveying lines from the storage tanks to blending tanks and coating

7—When single unit is to be shipped, package may be inserted into bag through metal jaws. 8—When unit is pushed through, the jaws open to proper size to admit box without damage to bag.



PHOTO, COURTESY P. LORILLARD CO.

pans. This procedure assures a uniform product. Since there is no manual handling of asphalt at any time, its storage and use require a minimum of labor.

Characteristics of asphaltic X-crepe

Asphaltic X-crepe is intended to be a protective barrier and is not designed, in most cases, to carry the load of the package.

In the process described above, it was pointed out that the paper and asphalt are creped and contracted together. When placed under stress, the crepes or pleatings of the paper and asphalt unfold together, allowing the sheet to expand under the strain, while it retains its protective qualities. If the sheet is uncreped, it has no expandability and is, therefore, subject to breakage when the strain or shock exceeds the mechanical strength of the paper. If it is creped in one direction only, it is expandable in only one direction and is still subject to breakage in the direction in which it is not expandable. This is illustrated in Fig. 3 which shows the results obtained by causing various types of papers to bulge a uniform predetermined distance on a Mullen tester.

In the use of waterproof papers, it is important to keep in mind that the quantity of the waterproofing medium (usually asphalt) does not always determine the degree of protection that will be secured. Even a 30-lb. coat of asphalt, if applied in a continuous unbroken film, will give a reasonable degree of protection if it can be maintained in this condition while actually being used. Likewise, the degree of protection does not necessarily increase in proportion to an increase in the weight of the kraft used.

Probably the greatest obstacle in securing a high degree of protection from flat unstretchable waterproof paper is the difficulty of maintaining both the asphalt and the kraft in a continuous unbroken condition when made into a case lining or formed around corners and irregular shapes. When a non-stretchable waterproof paper is folded over onto itself through an angle of 180 deg. during its fabrication or even when folded around the corner or edge of a box through an angle of 90 deg. the paper on the outside of the fold is subjected to very severe strains. The heavier the combination, the greater the radius of the fold and, therefore, the more difficult it is to make the fold without rupturing the paper and the asphalt coat. Even though the strength of the paper is supplemented by reinforcing materials, seldom is the mechanical strength of the combination sufficiently great to resist these folding strains.

In contrast to the flat non-stretchable papers, double creping and its resultant all-directional stretchability produces a finished sheet which is extremely pliable and is particularly well adapted for forming around corners and creasing without loss of its protective qualities. When creased or folded, each ply of X-crepe gives up just enough of its stretch so that it does not resist the strain of folding. The ply on the outside of the fold gives up more stretch than the one on the inside. The original protective qualities are thereby retained because the continuity of the paper and the asphaltic coat remain unbroken. This is well illustrated by the moisture-vapor tests on both creased and uncreased X-crepe.

Prewar uses for asphaltic X-crepe

Prior to the present war, X-crepe had a wide range of applications. One of its biggest uses was for the making of waterproof paper-lined bags where the X-crepe was adhered to burlap or cotton. The fabric carried the load and the X-crepe supplied the protection against moisture, siftage and contamination. In this respect, X-crepe did an outstanding job due to the fact that it was just as stretchable as the fabric to which it was attached and therefore remained unbroken under severe handling.

X-crepe, either reinforced with a fabric or not, also was widely used as a base for imitation leathers. The surface is adaptable for coating purposes and the fact that it is expandable in all directions makes it possible to emboss it with heavy grains without rupturing the coated surface. It was rapidly becoming one of the popular materials for the making of inexpensive luggage, brief cases, school bags and similar articles when the war stopped its production for civilian purposes.

Submersion-proof packages were made from asphaltic X-

crepe before the war and were used mostly by the makers of blasting powder. The powder was encased in an X-creped tube and placed in the bottom of the hole drilled for that purpose. In a very large percentage of the cases, the powder was actually under water and it was the function of the crepe material to keep it dry until all the holes were charged and fired. The seams of these X-crepe tubes were made with latex prior to the war.

A war bag is born

Even though X-crepe had been used for the making of submersible powder tubes, the requirements of the armed forces for moisture-vaporproof and submersible packages created many new problems. Whereas the powder tube was cylindrical in shape and relatively small, overseas packaging required that containers of all sizes and shapes be protected in a manner that would insure safe delivery of the contents. It became evident very early in the war that to produce such a package required a completely new approach to the whole subject of export packing. While years of experience had indicated that asphaltic X-crepe would meet the requirements for a basic material, a new technique had to be developed for its fabrication into a protective form which would meet the high requirements of the Army and Navy.

First of all, there was the matter of a suitable seam adhesive. Rubber latex was no longer available. After several months of testing and checking a wide range of adhesives, it was determined that none of them were entirely suitable for the making of completely submersion-proof bags on a high production basis. The manufacturer of X-crepe, therefore, turned its research and development facilities to the creation of its own adhesives. The result was a seam adhesive made from non-critical materials which has proved highly effective over a very wide range of conditions. This adhesive has been used in actual production for nearly two years and has been approved for submersion-proof bags.

Having the base material and a suitable seam adhesive, there was still the problem of how the bags should be made so that the seams would be just as waterproof and moisture-vaporproof as the body of the material itself. It was evident that the standard types of bags with square pasted-in bot-

toms, intucked sides and outside closure strips would not meet the requirements. It became necessary, therefore, to develop a procedure whereby a flat bag could be made complete from a single sheet of material with the adhesive for making the bottom and top seals on the inside of the bags so that there would be no crevices or unprotected areas through which water or moisture could seep. Having reached this conclusion, it was necessary to design and build bag-making equipment to produce these bags as there is no such standard equipment on the market.

The best possible bag, however, becomes worthless unless properly used. So it was necessary to develop methods of inserting, loading and sealing these bags in a manner that could be easily adapted to production-line procedures. It seemed especially important that these operations should be kept as simple and easy to perform as possible because it was certain that many companies would be called upon to use bags who had no experience with this type of packaging.

Since these bags are intended to provide protection only to the contents, they are normally used as a lining for the shipping case. The shipping case may be either wooden or any of the accepted types of fibre boxes such as the highly effective "V" type solid fibre. The bag is sandwiched between the wall of the outer carrying case and the supplies being shipped. Each bag is tailored to fit a given size container and, therefore, all bags are made for specific applications.

Generally speaking, supplies are prepacked either into a number of small units or into a single unit for each shipping case. This has necessitated the development of two distinct procedures for the inserting and loading of the bags.

- a) This method consists of preforming the bag over a mandrel as shown in Fig. 4. The mandrel is so made

9—Loading and sealing line at Penn Tobacco Co. 10—Loaded bags pass through pressure-sealing machines. 11—The air is expelled by a pair of pressure shoes. After sealing, package is ready for putting on lid.



that when the bag is placed on it, it is in a semi-collapsed position, making it easy to place the flat bag over it.

Fig. 5 shows the mandrel expanded to its full size which is just slightly less than the inside dimensions of the box to be lined. The bottom of the bag is folded over and the ears turned down along the sides. Fig. 6, the preformed bag is placed in the shipping case and is ready to be loaded.

This procedure is usually used where the contents consist of a number of small units which are packed directly into the bag. A typical example of this type of assembly is the blood plasma pack in which 12 complete and separate units are packed in each X-crepe lined shipping case. After the bag is loaded, it is sealed over the contents and the case is ready for closing.

- b) In this case, the product to be shipped is first packed in a single unit and this unit then inserted into the bag through a pair of light metal inserting jaws as illustrated by Figs. 7 and 8.

It will be noted that the flat bag is placed over the inserting jaws while they are collapsed. The unit is then pushed through the jaws which open up the bag to the proper size and admit the box without damaging the bag. The inserting jaws are made to fit the size package to be loaded as snugly as possible, allowing only enough extra room to permit easy insertion. If only one of these units is to be put in each shipping container, the bag is usually closed after it has been put in the shipping box. If two or more units go into a box, the bags are usually closed before being placed in the box. This type of packaging is exemplified by the 10,000-cigarette pack in which the cigarettes are first packed in a corrugated carton, this carton inserted in the special X-crepe bag and the complete unit placed in either a solid fiber or wooden shipping box for overseas shipment.

Sealing the bag

The question of how to seal any bag to make it watertight and moistureproof has long been an important one. It had become generally accepted that the best way to make a moisture tight seal was to apply a thermoplastic sealing compound to the mouth of the bag and seal it by the use of heat and pressure. This type of seal had certain inherent objections and in addition it seemed quite likely that there would be many who would require bags for export packing but who would not need sufficient quantities to justify the installation of the expensive heat-sealing equipment. Special adhesives were therefore developed for a closing procedure which could be made simply by applying cold pressure. As a result of this development, the bags are effectively sealed by a pair of cold, knurled pressure rolls. An adequate sealing machine may be purchased for approximately eighty dollars or a sealing machine may be made in the packer's own shop as many have done for a very nominal cost.

The maker of X-crepe has assisted the users of its bags in setting up loading and packing lines so that these operations are performed with inexperienced help with only a minimum amount of training. Anyone who has a few girls, a conveyor, a simple bag-former and a pair of power-driven knurled rollers is ready to use the bags on a production basis. Existing loading lines have loaded and sealed bags in quantities up to 8,000 in a single 8-hour shift. Figs. 9, 10 and 11 show a

loading and sealing line made in the plant packing the Army Component Kit.

The bags were preformed and inserted in the boxes as shown in Figs. 4, 5 and 6. Note that as the loaded boxes approach the sealing machine, the protective cellophane has been removed from the lines of adhesive around the mouth of the bag and the top formed ready to be sealed. The air is expelled from the bag by a pair of pressure shoes and the bag is sealed by the application of pressure only. The sealing operation draws the package over the conveyor and delivers it at the opposite side ready to have the lid put in place for shipment.

Moisture-vapor and submersion tests

Moisture-vapor transmission tests on X-crepe made by independent laboratories show unusually good results both before and after the X-crepe is creased or crumpled. There is practically no increase in the moisture-vapor transmission rate after creasing and crumpling. This characteristic of X-crepe is due to its construction. The creasing of ordinary asphalt laminated papers usually increases the moisture-vapor transmission rate 6 to 8 times over the reading on the same material in an undisturbed state. It must be kept in mind that the real test of a protective material is the degree of protection that it gives after being packed and handled in actual shipment.

The following tests were made in the Southwick Cabinet at a temperature of 100 deg. F. and a relative humidity of 95 per cent and show the number of grams of moisture which passed through the sheet in 24 hours per 100 sq. in.

Tests made by the General Foods Laboratory showed the following rates of transmission:

	Uncreased	After Creasing
X-crepe Triplex, Type H-1	.13 gram	.16 gram
X-crepe Quadruplex, Type J-1	.06 gram	.06 gram
X-crepe, Type H-1, crumpled	.....	.20 gram
X-crepe with lead foil sandwiched between two plies of X-crepe, crumpled	.....	.03 gram

In contrast to the above, aluminum foil laminated to 20-lb. basis non-stretchable film, gave results as follows:

Flat	0.3 gram	.....
Crumpled	.....	1.06 grams

This indicated that a material as moisture-vaporproof as foil in a flat state must be well protected if it is to retain its moisture imperviousness after distortion. It is evident from the above tests that it is not necessary to use foil in conjunction with X-crepe in order to secure protection against moisture-vapor.

The Institute of Paper Chemistry of Appleton, Wis., under the direction of Dr. G. R. Sears ran a series of tests on made-up bags loaded with calcium chloride. Each bag had an effective surface of 627 sq. in. The tests were carried on over a period of several weeks at a temperature of 100 deg. F. and 95 per cent relative humidity. X-crepe, Type H-1, showed the following rates of transmission per 100 sq. in. for 24 hours:

Maximum.....	.20 gram
Minimum.....	.146 "
Average.....	.177 "

The maximum transmission rate for Ordnance Method II packing is .25 gram.

Repeated tests made both in the company laboratory and elsewhere indicate that goods enclosed in X-crepe submersible bags may be submerged in water for long periods of time without harmful effects. On October 24, 1942, the company submerged a quantity of both Type H-1 and J-1 X-crepe bags under a 27-in. head of 20 per cent solution of salt water. One each of these bags was removed every 30 days. The final ones were taken out at the end of one year. In every case the contents of the bags were dry.

Fig. 13 shows a photo taken after the wooden box lined with one of these bags, loaded with ammunition was submitted to temperatures as high as 150 deg. F. and as low as -30 deg. F., severely handled and then submerged for a period of 45 hours. Note that the wooden box was badly damaged but that the X-crepe bag is intact and that the contents were perfectly dry, indicating that not only will the X-crepe resist submersion for long periods, but that the seams and bag closure are just as effective as the material.

War uses of this material

Briefly, the uses of X-crepe may be outlined as follows:

1. Protection against high humidity during transit and storage.
2. Protection against water formed by condensation in the holds of ships.
3. To make packages watertight when submersion is required either when unloading a ship or elsewhere.
4. To make possible flotation of packages (contents permitting) without damage to the contents.
5. Protection against rain during storage on docks and during transit and storage in the field.
6. Protection against contamination.

The extent to which the material has been used for these purposes has been limited only by the amount that could be produced. It has been necessary to consider carefully the many places where it might be used and apply the available production to those applications which seemed to need it most. Under the sponsorship of The Office of The Quartermaster General, the maker of the material is just completing an extensive expansion program. This is intended to increase production approximately 300 per cent.

Cigarettes, considered high on the list of essential morale items, have been packed for overseas shipment in X-crepe for

more than a year. Each shipping container is lined with X-crepe and contains 50 cartons or 10,000 cigarettes, sold at the Post Exchanges. Special component packs which include a variety of cigarettes, tobaccos and other items intended to maintain the spirit of the fighting men go in with the landing forces and are distributed by the Government to the soldiers before the Post Exchanges are established. These invasion items likewise are similarly packed to insure their safe arrival. Other items include both wood and book matches, playing cards and chewing gum.

The Medical Corps has standardized on X-crepe as the lining for its "V" type shipping container to protect blood plasma which has saved so many lives on the battlefields. Other important medical supplies such as penicillin and Atabine have likewise been packed in X-crepe.

Photography plays a very important part in modern warfare and it is essential that photographic supplies be in perfect condition when they are used. The standard pack for films and sensitized papers include sealing in an X-crepe bag.

When it comes to the packing of Ordnance supplies, the number of parts that are being protected by this material are too numerous to attempt to itemize. A few outstanding examples, however, include engine cylinders, starters, magnetos, fuel pumps, gaskets, tools, machine guns, electrical supplies, fire control equipment and many other types of equipment and replacement parts.

Shipment of gun fire-control equipment overseas in first-class condition has been accomplished by widely divergent methods in different instances. In one case, X-crepe is furnished to the instrument manufacturer in the form of rolls because the equipment is so large that it is impractical to prefabricate a bag large enough for it. The X-crepe is formed into a bag around the instrument before it leaves the manufacturer's floor. All seams, including the seal, are made by using an asphaltic ribbon which is supplied along with the material. Before the final closure is made, silica gel is placed about the unit to absorb any moisture trapped inside and the air is exhausted. When packed, the gun director is protected against rust and corrosion and is vaporproof and waterproof.

Other gun fire-control equipment has arrived in excellent shape because it was protected in another manner. The story was told by Brigadier General E. E. MacMorlund, Office of The Chief of Ordnance (*Continued on page 226*)

13—Manual equipment may also be used for pressure-sealing the bag. 14—Ammunition is kept dry with X-crepe.



Packaging pageant



2



1

1 Four Coty odors are now on the counters in new satin-covered boxes. The shape of the box is the same for each scent. Distinction is achieved, however, through the use of a different colored satin covering for each scent. The portal-like doors provided with tasseled pulls are lined with gold-colored mirrors which reflect the beauty of the bottle. Box, Arrow Mfg. Co., Inc., Hoboken, N. J.



3

2 A finely textured, frosty, sand-etched stock bottle holds "Bayberry Mist," a scent which captures the outdoor, tangy smell of the sea. A screw-thread metal closure is hidden inside the natural-colored wooden ball cap. A corrugated liner inside the folding carton protects the bottle against breakage. Bottle, Foster-Forbes Glass Co., New York. Etching, McKay Co., New York. Closure, Schutz Bros Inc., New York. Design, Thos. G. Blakeman, New York.

3 Of the three newly packaged items shown by Yardley, the lipstick refill is probably the most interesting packaging job. The refill is set into a red and white wooden base and the tubular cover is made of spiral-wound cardboard covered with decorative paper. The lipstick itself has a collar of wax-paper perforated in two rows which acts as a stabilizer in case the lipstick must be used directly from this wartime container. The collar also protects the user's fingers from stains when she transfers the refill to a metal container. The jar of cleansing cream is fitted with a screw-type paper closure and has a printed cellophane label. The toning lotion has a threaded, molded closure of urea with a laminated foil and paper liner. Wooden base for lipstick, Wood Utilities, Inc., New York. Paper Tubes, Seely Tube & Box Co., Newark, N. J., and Everbest Paper Tube & Can Co., Ridgewood, N. Y. Decorative wrapper, Continental Printing Co., New York. Jar, Hazel-Atlas Glass Co., Wheeling, W. Va. Paper cap, F. N. Burt Co., Inc., Buffalo, N. Y. Bottle, Anchor Hocking Glass Corp., Lancaster, Ohio. Urea cap, Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.



4

4 Two new Consolidated Biscuit Co. products are "Crakin' Good Saltines" and "Crakin' Good Graham Wafers." Both of the folding cartons are designed to fit into the "Crakin' Good" family of biscuits. The Saltines box is powder-blue while the Graham crackers are packaged in Burgundy. Both are overwrapped in cellophane. Box, Empire Box Corp., Chicago.



5

5 "Jack Pot," a scouring pad made of plastic, has been developed by Tudor Products, Inc., for cleaning glassware, enamelware and porcelain. The brightly colored, stapled fold-



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7



8



10



over, a wartime package, is cut out on both sides allowing the customer to feel the softness of the pad. Fold-over, Woodruff Printing Corp., New York.

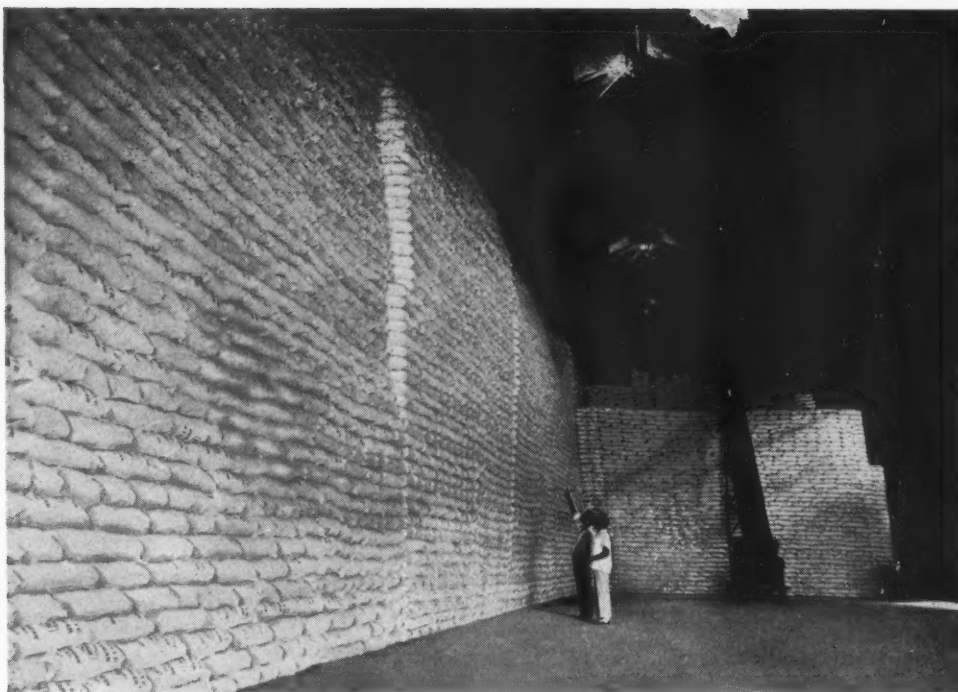
6 Steno-Aide Inc. has come to the rescue of the ailing typewriter with a kit of five products designed to make the stenographer's life a happier one. The complete kit is packaged in a setup box with a hinged cover. Partitions separate the box into compartments, making it an ideal permanent container to tuck away in a desk drawer. Printed on the inside of the cover are complete instructions for use.

7 "Private Stock" Sally Victor's new perfume achieves an unusual packaging effect through the dramatic use of cerise and black. The bottle is affixed to a wooden base while the wooden closure is fitted with a plastic thread and laminated paper liner. A tightly fitting over-case, also of wood, covers the bottle when not in use and the whole unit is boxed and "gift wrapped" in black paper surprinted in cerise. Wood Turning, Paragon Wood Turning Co., New York. Bottles, Swindell Bros., Baltimore, Md. Wrap, C. J. Herrick Associates, New York.

8 After a three-year absence from the market Gambine Tincture and Gambine Ointment (veterinary products) return to the shelves in their new dress. The ointment, formerly in tubes, now comes in an amber jar and both products are packaged in larger sized units than before—the bottle holding a pint of tincture and the jar a pound of ointment. The labels have been reworded to conform to the law. Jar, Hazel-Atlas Glass Co., Wheeling, W. Va. Bottle, Owens-Illinois Glass Co., Toledo, Ohio.

9 Full color food illustrations from a Kodakrome photograph are used effectively on this folding box for "Golden Mix," packed by Soy Food Mills, Inc. The carton has many of the elements of a basically good package—recognizable brand name and product identity, complete product description plus eye and appetite appeal. Box, The United States Printing & Lithograph Co., Cincinnati.

10 To conserve tin, "Biolac," Borden's complete infant formula, now comes in the new 13-fl. oz. can instead of the 16-fl. oz. one formerly used. The new product is more highly concentrated so that it will make exactly the same amount of formula by the addition of 1½ parts of water instead of equal parts as before. Directions on the new small can are especially explicit on this point. The new can saves approximately 18.5 per cent in tin plate, also saves shipping space and weight.



1—Tons on tons of Cuban sugar stacked in textile bags.

TEXTILE BAGS—their present and future

Bags carry more of the world's goods than any other type of container. Among the oldest types of bags are those made of textiles. The textile bag came into its own for mass production about 1850 after the invention of the sewing machine. One of the oldest textile bag makers today carries the inscription, "founded 1858," on its company letterheads.

Normally the textile bag industry cuts about 1,500,000,000 yards of fabric, approximately half burlap and half cotton. Government requirements for 1943, including military and Lend-Lease uses were estimated at approximately 2,500,000,000 yards all to be used in making bags. It is estimated that there are more than 500 kinds of textile bags plus innumerable variations of these. They are used to package a list of products equally as long. They range in size from giant 7-ft. long bags for wool to tiny tea bags and mailing sacks for samples one or two inches square.

During the decade immediately preceding the present war, the use of textile bags was constantly increasing, particularly for the packaging of chemicals and agricultural products, due to the increasing costs of wood and other packaging materials. The original cost of a textile bag is said to be less than a wood or metal container of equal capacity. Two textile bags, for instance, cost less than half the cost of one barrel.

When the war came, the shortage of other materials practically doubled the demand for textile bags. They were needed for hundreds of commodities shipped for Lend-Lease and the Army and Navy. Millions were needed for sandbags for the protection of civilian property and for the protection of gun emplacements and other military operations.

This placed a burden on the textile bag to withstand rough handling the like of which had never been required before. What was considered an exceptionally good "moistureproof"

container previously was not sufficiently protective to endure long periods of outdoor storage on a pier, on the decks of a ship, or soaking when loaded on invasion barges.

These requirements are leading to the development of textile bags in combination with paper and other materials, which now and after the war will have many advantages because of the added strength, scuff resistance and water shedding qualities that can be imparted to a container by the use of the textile as an integral part of the bag.

Generally speaking, there are four kinds of textile bags—

- a. burlap
- b. cotton
- c. cotton or burlap in combination with paper.
- d. woven paper.

Burlap bags are one of the cheapest and most durable packages that can be chosen for bulk shipment of dry materials. Burlap is made from jute which is grown in India. (Not to be confused with the word "jute" denoting scrap in paperboard making.) Jute is the fibrous part of a plant which grows from 5 to 15 feet high. The fibres are located between the outer covering or bark and the stalk of the plant. To remove them from the stalk, they are immersed in water from 8 to 80 days.

The fibres are classified for grade and color and sold according to quality. Most jute is converted into cloth in India, although before the war a small amount of it was converted in European countries. One or more grades of fibres are usually blended to obtain proper mixtures.

The cloth is woven in a variety of constructions and is finished in several different ways. Jute, however, is a coarser fibre than cotton and therefore does not make as uniform a product. The products of each burlap mill in

India are inspected and tested each year in normal times by a representative of one of the large bag manufacturers in cooperation with other companies in the industry and quality classifications are issued dividing all jute mills of India into A, B, C and D groups. This grouping is based on certain factors found to be present, such as weaving defects, short yardage, wrinkled and folded ends. This mill grouping is used as a quality guide by the buyers of burlap goods.

The weight of the burlap, the twist of the yarn and the manner of weaving are chief elements in the strength of the cloth. The size and twist of the threads and the number of threads woven in a given distance determine the weight of the cloth. Jute weavers call the threads that run the length of the cloth or warp threads, "the porter," and the threads that run at right angles or filling threads, the "shot." The number of threads per unit of measure in the "porter" and in the "shot" is called the count. The count, thus, to a great extent determines the strength of the cloth.

Burlap bags are used where strength is paramount and appearance is not so essential. They are usually used when comparatively large amounts of a product are to be packed in one unit. Burlap bags may hold 200 to 225 lbs., although modern practice is to use the 100-lb. size which can be easily handled by one man.

At the beginning of this war, burlap shipments from India were virtually cut off due to blockade and submarine warfare. Now, however, with the Mediterranean again under Allied control and more of the sea routes opened up for Allied shipping, considerable quantities are again coming into this country. However, all textile materials are under strict Government allocation due to the heavy demand and both burlap and cotton are difficult to obtain except for essentials.

Cotton bags are more generally used where appearance and cleanliness are important. Up to 1900 cotton goods for use in bag making was produced largely in New England mills, but since that time there has been a gradual migration of these mills to Southern states. Today 90 to 95 per cent of cotton goods for bag purposes are produced in the South.

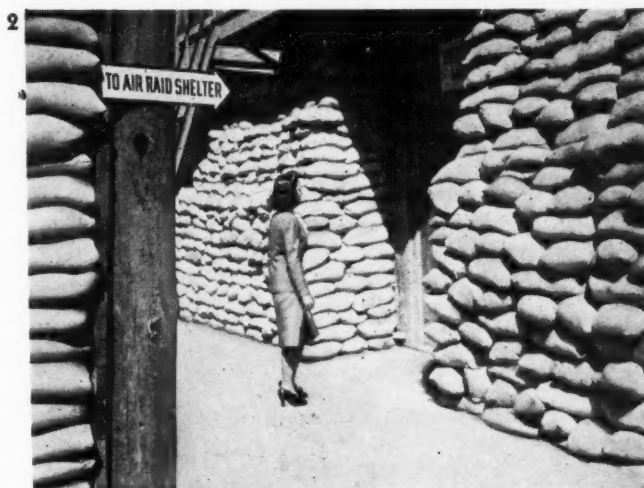
Through research, improved equipment and increased efficiency considerable progress has been made in standardization, consistency of quality and finish of cotton cloth.

Constructions for 100-lb. cotton containers as well as liners are usually confined to a limited number of widths, such as 30, 31, 32, 36 and 40 in. in styles known as sheetings, drills and osnaburgs.

Sheeting styles are classified by yards per pound, such as 36 in., 4 yards per lb.; 36 in., 2.85 yards per lb.; 40 in., 2.85 yards per lb. They are generally made with 48 warp and filling threads per inch each way. Some constructions are bleached, clay sized and calendered to provide protection for the product, to prevent sifting and to give a better appearance and a better printing surface.

Drills, which are a herringbone weave, are used relatively little for containers and principally for bags under 100 lbs. where added sifting protection is required. These constructions are made in 30 in. and 36 in. widths, with warp and filling counts 70 by 48 in. and the weights 2 to 3 yards per lb.

Osnaburg is a coarse, heavy-duty cotton fabric made in medium and heavy weights. The heavier weights are described in ounces per yard rather than in yards per pound. The principal heavy weight constructions are 30 in. and 36 in. at 7 oz. per yard and 40 in. at 7 and 8 oz. per yard. These



PHOTOS 1, 2, 3, 8. PRESS ASSN.

3



2—Millions of textile bags have been required for the protection of civilian property against air raids. 3—Many more millions have been used in military operations including the protection of gun emplacements.



4

4—Lend-lease sugar in cotton bags stored in warehouse at Casablanca, North Africa. 5—Properly handled, flour, sugar and corn meal in textile bags can be stacked quickly and efficiently in the hold of a ship. Protective liners prevent moisture transmission and the sifting of contents.



5

are used for such products as cement, chemicals, fertilizer and other heavy materials, and can sometimes double for burlap.

Lighter weight osnaburgs such as 36 and 40 in. widths weighing 3.50 yards to the pound are used for coarse materials such as feed, salt, etc.

Seamless cotton bags are made from cotton woven in the form of tubing. They are excellent for multiple-trip or heavy duty service. They are made in 1, 2 and 2½ bushel capacities for shipments of grain, beans, seeds, flour, sugar, etc.

Combination bags of textiles and paper were devised by bag manufacturers to broaden the use of their containers for products which ordinarily would be unsuited to a textile bag, such as calcium chloride, alum, copper sulphate, sodium hyposulphite, dyes, paint pigments and insecticides.

Some powdered products sift even when packed in bags

made of very closely woven cloth. Other products absorb moisture or give off moisture and therefore must be given more protection from the atmosphere than can be provided by textiles alone; others must be kept free from contamination.

To overcome these difficulties, the makers of textile bags at first lined their bags with plain kraft paper. This was tried before the turn of the century, but the scheme was unsatisfactory because the paper lining was apt to break. In 1898, the first crepe paper appeared on the market and this opened up a new avenue of development. Creped paper could be made to conform to the interior shape of the outer container with greater ease and offered better protection. Instead of depending upon the tensile strength of the paper, the crepe paper could yield by giving up its stretch and thus transfer the strain off itself and onto the outer container. Many improvements in liner design and moistureproofing were made as demands increased in volume and application. Today there are many types of liners and degrees of moistureproofing available to suit many needs. Liners are also produced which are quite resistant to alkali and acid actions.

Loose liners, today, fall into two classifications—the single-stretch and the double-stretch type. Single-stretch liners have about 33 per cent stretch around the width of the bag but no strength in length. Double-stretch liners have approximately 33 per cent stretch in both directions. The stretch feature, aside from the care exercised in insertion, filling and closing the container, has more bearing on the performance of the liner than any other item. To avoid placing strains on the liner, its minimum stretch must equal the stretch of the outer textile bag in every direction. Liners have been treated with various coatings and impregnations to incorporate into them resistance to transmission of moisture and grease.

The efficiency of the loose liner, however, is dependent on the care with which it is handled. The fit of the liner must first be most carefully determined. The way it is inserted into the outer textile bag is likewise a very important operation. This must be done so there will be no strains exerted on any part of the liners when the bags are filled. Special attention must be given to the closing of the outer bags and the liners. Liners should always be closed separately from the outer bags, because any closure of the outer bags which includes the liner may cause strains and breakage of the liner.

A later development during the last fifteen years is the textile bag with attached or laminated paper liner. This unit has many advantages in that it can be handled as a single unit. This container consists of an outer textile bag with a paper liner containing stretch in all directions. The liner is attached to the burlap or cotton with an adhesive. This type of liner is known in the trade as W.P.P.L. (waterproof paper lined).

Asphaltic cements are the most common type of adhesive used to bind the paper to the fabric because they are more moisture resistant than most other adhesives. Much progress has been made in the use of various types and kinds of asphalts to overcome brittleness at low temperatures and softening at high temperatures. The use of other materials with asphalt have also been found to give the results which are required under special conditions.

Rubber latex was being used as the adhesive between the outer burlap and the first paper lining before the war, but such development has been retarded due to the wartime rubber situation. Right now some extensive experiments are being conducted with the use of vinyl and other plastic resins as laminants and seam sealing compounds which are expected to mean great progress in this field in the very near future.

The weakest points of any container in connection with waterproofing are at the seams. A recent development in bag making is the use of cemented seams instead of stitching. Means are also being provided for heat sealing the bag after it is filled to produce a highly moistureproof sealed container. Other developments make use of pressure-sensitive tapes for reinforcement of seams and closures.

The methods of closing textile bags are as follows:

1. Machine sewing is found advantageous for volume production. After passing the filling spout the bags move by conveyor to a sewing machine through which they are hand guided. The usual stitch used is the double-locked stitch. Regular practice is to use four stitches per inch, except in cases for finely powdered materials, where a closer stitch is efficient. To close 100 bags 19 in. in width there are required 464 yards or 0.2303 lb. of 5-ply No. 12 thread in the needle and looper of a sewing head. This is an example of how twine closure costs may be estimated. One of the large bag manufacturers furnishes a table so that bag users may know how much sewing thread is required for any particular size of bag.
2. Hand-sewing is usually done with a large needle made

especially for bag closing. A loop stitch is usually used over the rolled bag mouth, forming ears at each end.

3. The wire tie is also a hand method. The mouth of the bag is gathered and twisted slightly. Then a piece of malleable wire looped at both ends is applied with a twisting tool.

4. Tape sealing and heat sealing. The use of cementing tape over the mouth of bags with attached liners and of laminated materials to effect a closure is now coming into wider usage. It may not be long before a heat sealing operation is perfected for these types of containers.

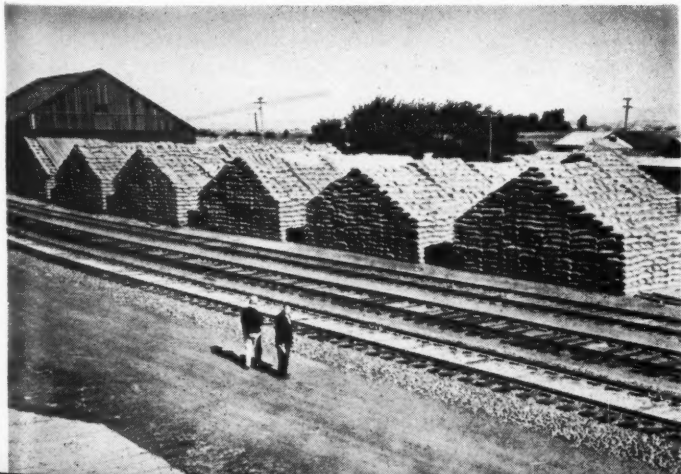
An important consideration in closing textile bags is the amount of spill room allowed. A bag does not resist severe drops or shocks unless there is some space for the load to shift. This is a feature of hand sewing to be carefully watched, since the bag sewer may not always allow for sufficient spill room. As a general rule there should be a minimum of $\frac{1}{2}$ in. and preferably 1 to 2 in. from the level of the contents to the closure. This measurement should be taken with the bag standing on its butt and both walls of the bag brought together, pressing on the top of the contents. The closure should then be $\frac{1}{2}$ in. above the point where the center of the walls of the bag meet and contact with the contents. More spill room should be allowed in a 100-lb. bag than in smaller sizes, as stresses and strains are greater in the larger package.

Textile bags are almost always custom made for the product to be packed. Before the proper bag or bag with liner or lamination may be recommended for a new product such factors must be determined as: (1) fineness of the product, (2) its flowing qualities, (3) weight per cubic foot, loose or settled, (4) percentage of moisture contained, (5) required protection against moisture loss, (6) hygroscopic or deliques-

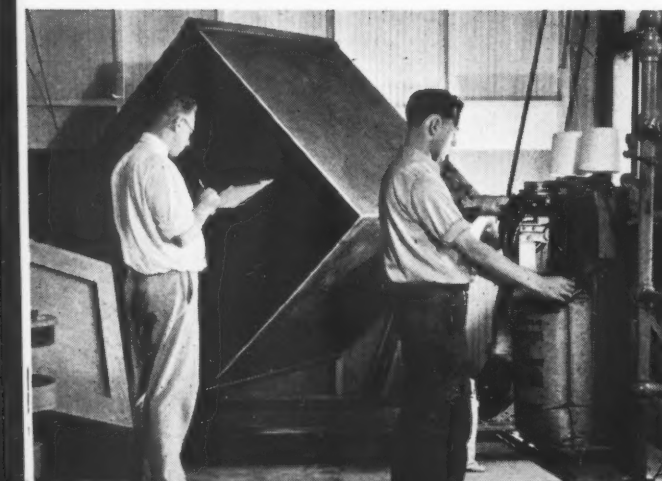
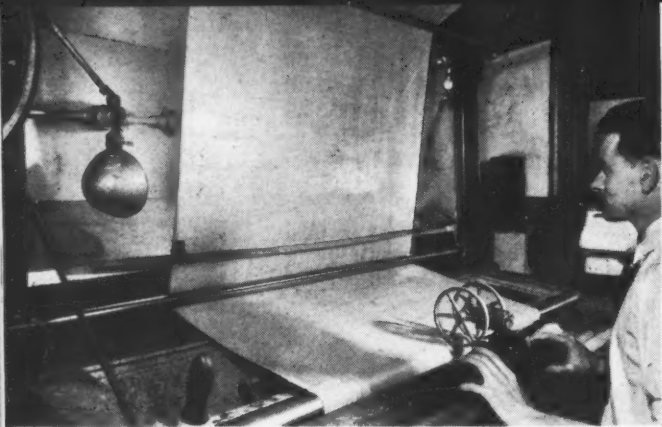


6—Small cloth bags used in war industries for packing small machine parts. 7—Open-mesh bags for packing onion crop. These bags are pinch-hitting for crates and boxes today. 8—Open storage of wheat in textile bags; special stacking protects contents from the elements.

8



7



9 cent properties, (7) chemical action on fabric or paper, (8) type of package now used, (9) filling, weighing closing methods, (10) where and how it is shipped (rail, truck, air, steamship, etc.) (11) how it is handled, (12) storage conditions.

Only when these properties of the product and handling conditions the package will undergo are known, can a bag of the proper tensile strength with the proper protective features be selected. Preliminary tests are usually made in the bag testing laboratory approximating all conditions of handling, storage and end use. To assure satisfactory packages it is also wise to make several actual shipping tests.

Laboratory tests for ruggedness or strength are usually made in the form of a drop test. Standard number of flat drops (landing on face of bag) are usually determined from a height of from 4 to 10 feet depending upon the service the bag must withstand. This is combined with a standard number of butt drops (landing on ends of bag) from a height of 2 to 5 feet. Dropping by apparatus is recommended, since dropping by hand may be inaccurate.

Bags may be tested for loss through sifting by weighing before and after drop tests and also by tumbling tests. Special apparatus is available for such purpose. In modern usage, bags may be submitted to severe submersion tests, temperature tests, puncture tests.

Another recent development is the treatment of textiles with mildew-proofing agents to prevent deterioration of the bags in actual use. Extensive tests have been made in this field for sandbags used by the armed forces.

A technical committee of the Textile Bag Mfrs. Assn. is at work constantly with the Government in working out specifications for all the textile and textile combination bags that are being used for hundreds of products shipped by Army, Navy and Lend Lease. All of these must meet rigid tests.

In addition to the proper selection of textile bag, the proper handling of these containers is an essential part of their successful use. Prior to the war, the Assn. of American Railroads gave a great deal of attention and study to the subject of proper loading of textile bags. Rules have been set down for preparing cars for loading—to have them carefully cleaned, all protruding nails removed, and bolts and other sharp edges covered with pads. There are also special instructions in loading to prevent friction of bags with car walls, and shifting in transit. This method of loading, known as the Key Sack Method, was said to have reduced claims on flour

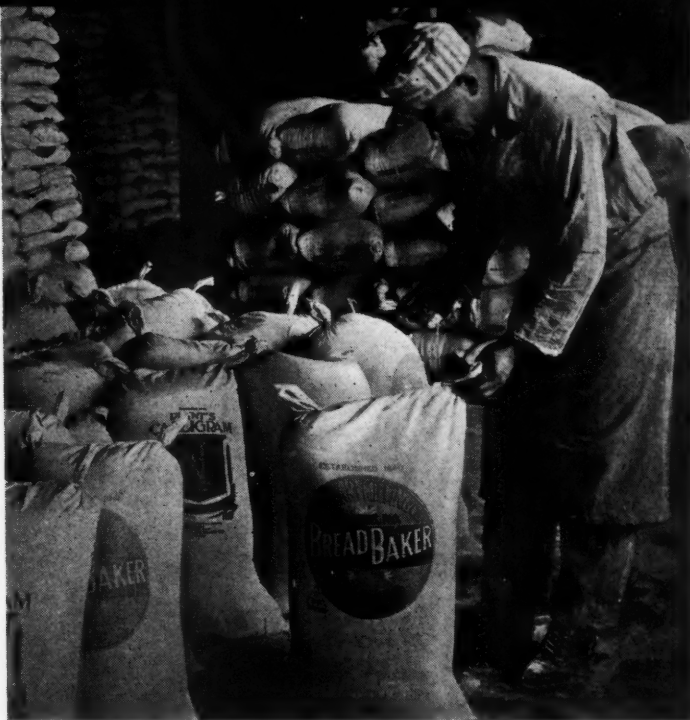
9—Inspection of burlap goods for width, weight, count and weaving defects. 10—Arctic testing box tests bags at temperatures below zero. 11—Weather-Ometer tests bags under all weather conditions. 12—Tumbling box for testings bags under all sorts of shipping conditions. 13—Laboratory test apparatus miniature textile bags.

12

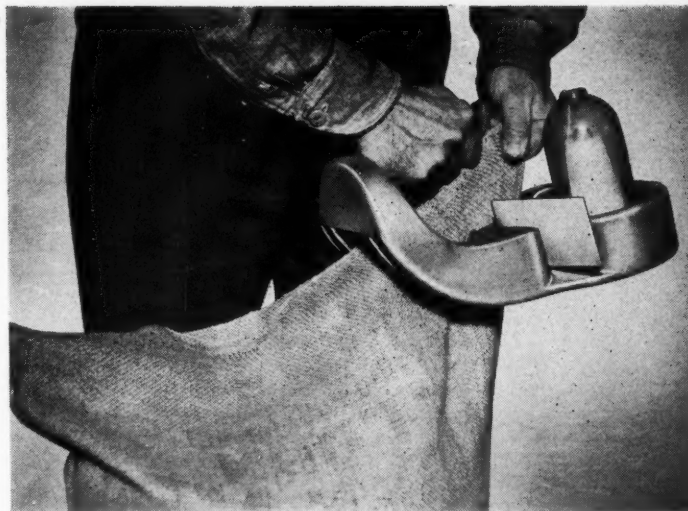




14—Bag closing on a standard bag closing machine. 15—Closing cotton bags by hand sewing. 16—Closing burlap bag with "super-looper"—convenient device for closing bags on small scale, but unavailable at present.



16



shipments from \$250,000 to \$38,000 a year. Users are also cautioned from using hooks or other harmful loading devices.

Textile bags are an important wartime container because of their re-use possibilities. Because of this salvage value, the manner in which they are opened is extremely important. If the tops are cut or have holes in them their value as re-use is likely to be zero. To open a bag tied at the top with twine it is simply necessary to cut the twine without cutting the cloth. A bag tied with a wire tie can be opened by untwisting the wire by hand. A hand sewn bag is opened by cutting the twine and pulling it out. Bags sewn by machine can easily be opened without damage as a chain stitch is used so that if the two ends of the twine are pulled the stitches will unravel readily. In normal times second-hand bags go largely into certain definite channels, but in these times when production schedules are loaded to capacity and the supply is way short of demand careful salvaging of every bag is one of the best ways to augment the supply. An example of the re-use value of textile bags is the cotton seamless bag. This is a strong rugged container, designed for multiple-trip use. It may be used for 20 or 30 trips and is often employed for inter-branch shipments. Bags are occasionally found that are still in usable condition after 20 years of continuous service.

Few people think of the re-use feature of a textile bag as a premium feature like a tumbler for cheese, a cookie jar package for crackers, a fancy cake box for fruit cake. Nevertheless it is estimated that 3,000,000 women and children are wearing clothes made from flour and feed bags. Such bags are made from gingham which the manufacturer has had printed with dress patterns. His trademark washes off, so that no one who sees a dress made from such material could tell that it was made from a feed bag. Two or three of these 39- by 42-in. feed bags provide enough material to make a dress for the most stylish stout. In 1941 bag manufacturers were turning out approximately 50,000,000 of these colorful bags. Plant Flour Mills Co., St. Louis, for instance, puts out its flour in such bags under the brand

name of "Gingham Girl." The added re-use feature of the package proved an excellent sales builder.

Another type of textile bag that should be mentioned is the open-mesh bag, made from strips of tough paper spun into yarn and woven into open-mesh cloth. These bags were used extensively for shipping fruits and vegetables and their use has increased greatly due to the shortage of boxes and crates. They are made in various colors to contrast or harmonize with the contents. They are available in both bulk and consumer sizes. Their appeal is the visibility given to the product and the color they add to displays in stores.

Because of their low cost, their space and weight saving, their ease in filling and closing, textile bags will continue to gain in application both now and after the war. The new developments including such features as stronger bags made in combination with plastic materials, wet-strength papers, waterproof tapes and other advancements, will produce bags which will be preferred on a large number of counts, particularly in the heavy-duty field.

Credit: MODERN PACKAGING is indebted to the following for source material for this article: R. W. Lahey, American Cyanamid Co., New York; Technical Committee, Textile Bag Mfgs. Assn., New York; Bemis Bro. Bag Co., St. Louis, Mo.; Chase Bag Co., New York; Cotton Textile Institute, New York.

DISPLAY Gallery



1 When La France decided to modernize copy and type on its individual box and its 12-box wall dispenser it was decided to improve also the hanging device on the dispenser in order to lengthen its life span. Formerly the tab at the top of the hanging unit was arranged so that if the box were folded according to directions the unit was suspended from a hole through two thicknesses of the paper which made a fairly solid dispenser. The retailer, however, never bothered to follow the directions, hung the dispenser by but one thickness of cardboard, and the first customer to pull out a packet of bluing usually pulled down the whole business. Now the tab has been redesigned so that assembling is simplified and three thicknesses are provided for hanging.

2 Racks and display cases which ordinarily contain Société candies are no longer left to stand empty when wartime shortages make merchandise hard to get. Cards, which fit into the empty space, keep the passerby pleasantly reminded of the products with a cheery "Remember Me?" and "Back Soon." The same positive merchandising trick is used on a similar card to replace depleted stocks of boxed candy. The fact that the shortages are due to war are not overly stressed but the message is put across in an optimistic way. Plates, Western Engraving Co., Seattle, Wash. Printing, Pioneer Inc., Tacoma, Wash.

3 A display which achieves a third dimensional effect of an entire barnyard is used by Dr. Salsbury to advertise his Par-O-San, a disinfectant and insecticide. Each one of the farm buildings carries on it a piece of copy which tells what the product will do for that particular house. The distributors suggest that the retailer build a window display around the colorful litho. Display, Stemar Display Co., Chicago.

4 A circular, cut-out, cardboard display which usually gets a prominent store traffic location in the stationary departments today is this "Quink" floor piece which holds eight dozen 4-oz. bottles of ink. It seems to be doing a fine job of suggestive selling. With fountain pens working overtime to keep home news flowing to the boys overseas, The Parker Pen Co. wisely provided an outstanding silent salesman for its product. The bottles, each in an individual folding box, are stacked on step-like shelves so that they can be picked up easily. The idea of "Quink—Cleans as it Writes"—is stressed in the copy which appears on the display. Display, Philipp Lithographing Co., Chicago.

5 Constructed of heavy cardboard, this three-color display shipping container makes an effective silent salesman for James H. Rhodes & Co.'s cosmetic sponges. A die-cut top piece which is entirely separate from the rest of the box is the retailer's protection against pilfering. The back piece of the display pictures various home uses for the sponge and provides a white circle for the retailer to pencil in the price. Display, Sutherland Paper Co., Kalamazoo, Mich.

6 Lederle's vitamin display, lithographed in 10 colors and gold bronze, is made up of six different parts. The center panel, 39 in. by 38 1/4 in. is set on an easel extending 14 in. below the base. The four cards, each 11 1/2 in. by 15 3/4 in., picture the four groups of vitamins. The strip which carries the Lederle Army and Navy Award insignia and the slogan, "Buy U. S. War Bonds and Stamps," is 34 in. by 6 in. The entire vividly colored display is in sharp contrast to the brownish-bronze background. Design and lithograph, Forbes Lithograph Co., Boston, Mass.

7 The centerpiece of the latest Parke, Davis & Co., institutional display is a faithful reproduction of an oil by Andrew Loomis depicting a boy of high-school age surrounded by prescription equipment. The small rider card which slips over the upper right-hand corner carries a "Men Wanted" message to the youth of America. The display is designed primarily to sell pharmacy as a career rather than further the commercial interests of the company. The shortage of trained personnel is already critical in some parts of the country and pharmaceutical schools have been graduating considerably fewer men and women than are needed to meet normal replacement requirements. The centerpiece is finished by a special process so that it can be wiped off with a damp cloth to lengthen its life span. It can be used as an inside display after it has served its purpose in the window. Four mortar-and-pestle side cards accompany the main display. Display, Einson-Freeman Co., Inc., Long Island City, N. Y.



SURVEY OF CURRENT OPERATING PRACTICES IN PACKAGING

by Henry J. Howlett*

Some years ago the American Management Assn. held a conference devoted entirely to shipping container subjects. The audience included a small group of consumer packaging people and when a member of this group was asked his reason for attending such a meeting, he stated, "I came here to find out what makes these shipping container people click and why we in the unit packaging field cannot be as good."

Observers have long been puzzled by the fact that so large a percentage of firms with vital consumer packaging interests have employed the services of men skilled and trained in packing and shipping, but have not given comparable attention to the problems of consumer packaging.

In the approaching period of reconversion, when competition will again be a dominant factor with new materials and new uses for old materials in the forefront, it will be not only appropriate but imperative that more thought be given to package development departments as such. Rationing has not been an unmixed evil. Shortages in basic materials of traditional use have stimulated the resourcefulness and imagination of packaging men and designers, with the result that unquestionably the use of war-born substitutes will be continued to a great extent in the postwar era.

Some firms have admittedly taken advantage of wartime material curtailment to cheapen their packaging, both from the standpoint of material and design. How they can do so with impunity is self-evident. If, for example, there is not sufficient coffee to go around, it is a rare householder who will care very much whether it is packed in a vacuum tin, a glass jar or a paper bag. Questions of keeping qualities also become less important in view of rapid turnover. However, when the nation resumes its normal peacetime pursuits, with accustomed materials in plentiful supply, competition will again force all manufacturers to fight for their markets—and next to the product itself, how can one fight better than with a package which will, as one packaging engineer says, "give the maximum product protection necessary, the best appearance possible, the greatest consumer utility, and the lowest over-all cost consistent with these factors."

Planning for package development must therefore take its place as an integral part of postwar planning if a company is to be in a favorable competitive position. One concern that helped with the survey on which this article is based goes so far as to say, "In a business of highly competitive nature, the company with the most colorful and original packages can easily pre-empt the market."

Progressive companies obviously must be prepared to adopt some sort of package development setup or, where one exists, revitalize it for greater efficiency in dealing with their problems in the face of new requirements.

The survey

To compile an accurate and up-to-date account of practices and trends in the organization and operation of a package

This and the article which follows should be studied together. One reports the results of a survey of actual practices. The other "blueprints" the ideal setup—how to start from scratch with a new department that would coordinate all aspects of the complex operation of a packaging development department.

development department, the American Management Assn. sent a questionnaire to a limited number of companies which, to our knowledge, maintained a package development department or which, in our opinion, probably should have one. Some 30 replies to this questionnaire were received and, in addition, personal interviews were obtained with representatives of some of the Assn.'s other member companies. Since answers were received from firms in the pharmaceutical, chemical, food, household appliance, petroleum, abrasives, rubber, photographic supplies, tobacco, textile, and electrical equipment industries, broad coverage of interests was assured.

The specific questions which we asked were:

1. Do you have your own package development department or do you rely on professional package designers and/or suppliers of packaging materials?
2. If you have a packaging department—briefly, how is it organized?
3. If you have a packaging development department, what background of education and experience do you require of the staff?
4. Do you have a training plan to develop packaging men in your company? If so, a brief description of its operation would be appreciated.
5. What procedure do you employ in developing new packages and in making changes in existing packages?
6. Do you correlate your packaging development activities with other vitally interested departments, such as production, sales, advertising, shipping, etc.?

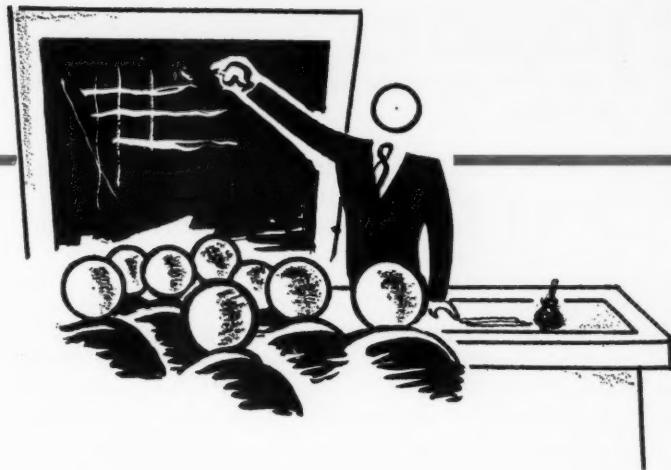
The response indicates that an encouraging number of companies have organized their own package development departments, regulate this function through committee action or are contemplating one or both of these steps. Sixteen respondents operate package development departments. Fourteen do not, but, of these, eleven perform a somewhat similar function through a packaging committee. Five companies supplement their package development department with a packaging committee, which acts in an advisory capacity. Three companies have neither a department nor a committee, two largely because of the nature of their product.

To an impartial observer, the weight of evidence here is overwhelmingly in favor of a packaging department with or without an advisory committee, and against delegating this important function to outsiders who lack the knowledge of company operations essential to a thoroughly competent job.

When packaging problems are entrusted to somewhat disinterested outside agencies, no matter how able, their prob-

* Secretary, American Management Assn.

PACKAGE DEVELOPMENT



able approach is simply one of artistic design. Important as this is, it is but one factor in the merchandising and utility success of a package. The questions of packaging machinery, production, shipping container engineering, dealer handling and, last but possibly most important, consumer utility, can only be completely evaluated by a group of people thoroughly versed in the policies and problems of the producing company.

Almost half of the responding companies have made package development a subordinate function in an established department, or a joint responsibility of several departments. This has the same effect as a packaging committee and, while it has proved successful in many instances, no such success is claimed for it as has been claimed by those who supplement a committee with a true package development department.

Most companies, apparently even those with well-organized package development departments, encourage suggestions on the use of materials and new designs from outside sources; principally independent designers and materials supply houses. It is agreed that open-mindedness in this respect keeps the department personnel apprised of developments in the field and provides a check on their own thinking. However, no company in this survey which relies primarily on outside package designers, supply houses or advertising agencies claims to have thus found an entirely satisfactory solution to its packaging problem. The responses of such companies indicate a palpable lack of interest in the packaging function and failure to grasp its true significance. There can be little doubt that the sales department, having been responsible for the greater part of the original planning, reaps the major benefit from the development of new packages or the redesign of old ones. But since the problem involves so many other factors of equal importance, this undue stress on saleability will not generally result in anything approximating a perfect package.

Personnel of a development department

Naturally, the staffs of package development departments vary sharply with the nature and requirements of the industry. For example, concerns in the pharmaceutical field must have men with a chemical engineering background which would not be required, say, in a textile company. In general, the department head carries the title of Package Engineer, and the department he directs is called the Container or Package Development Department.

A composite picture of this man would probably reveal a college graduate with experience in the elements of design and training in the policies and practices of his company—an individual who grew into his present position of importance. The best of these men have come to the top not through sales but through production. This experience has instilled in them an important trait, the ability to evaluate properly the characteristics and utility of materials.

The staff members of packaging departments are generally

technicians selected for particular aptitudes of the same general types as those possessed by their chief. Most of them are recruited from other departments, though in a few instances the ranks of college graduates are surveyed for candidates. One well-managed company states that, since it employs technicians capable of advising the packing department on technical questions, it is unnecessary to employ men with basic technical education. So long as such men are not permitted to "step out of character" and unduly influence the packaging experts in matters of which the technicians have no knowledge, this seems to be a satisfactory and inexpensive arrangement.

One point which should be stressed (although it is probably obvious) is that men selected for service in the packaging department must be persons who have indicated aptitude and liking for this type of work.

Discussions with packaging men inevitably bring forth what is probably the \$64 question, "To whom should the head of the package development department report?"

Although this query was not included in the survey questionnaire, an analysis of responses indicates that the head of the package development department should *not* report to either the production or the sales department. Preferably, he should report directly to the executive vice-president or general manager, failing which the greatest impartiality is secured through control by some such agency as the research department or the products development department. While an investigation of current practice would probably show the advertising or sales department in control, the results achieved in such cases do not warrant recommending this as general practice.

Training of packaging personnel

Few respondents indicate the existence of what may be termed a formal training program. As a matter of fact, only four reported such a program. Many, however, have informal training plans, some of which are described in the following excerpts from responses:

"Our training method is to bring men along after graduating from college to either our Container Laboratory or the Container Department after a preliminary six months' training course throughout the plant."

The reference to plant training should be taken to include training in sales and purchasing as well as production departments.

"We train our packaging men through experience gained by working with our own package assembly units and by contact trips to sources of supply, particularly those who

have packaging research laboratories. This is supplemented by reference books, periodicals and visits to other plants where the packaging function has been highly developed."

* * * * *

"Our packaging men are trained by introducing technical graduates into our regular company training program and then directing those who show a particular aptitude for packaging into that department."

* * * * *

"Our training plan consists of teaching the nature of the merchandise and the kind of protection that is required for each class of equipment. We require full knowledge by these men of all classes of packaging material, material handling, work simplification, material procurement, costs, etc."

There are other methods of training candidates for the packaging department. A formal training program could be constructed around the following skeleton:

1. The routing of candidates through selected departments of the company, with actual apprenticeship periods in these departments.
2. Field trips to package supply houses, to concerns with well-organized packaging departments and to selected customers (this last in order to observe first-hand the actual conditions which packages encounter when they leave the manufacturer).
3. A carefully selected reading course comprising reference books, packaging catalogs, trade and technical journals, and other pertinent literature.
4. Attendance at professional meetings such as the American Management Assn., Packaging Conferences, meetings of such accredited organizations as the Packaging Institute and the Technical Assn. of the Pulp and Paper Industry, and the meetings held by the manufacturer's own trade association.

Many concerns might profit by investigating the possible application of the training principles advocated by the War Manpower Commission's Training Within Industry Branch. TWI, as it is called, is performing an invaluable service to industry in supplementing and reinforcing the training activities of individual plants. Its program, launched in response to the urgent need for quick training of supervisory and semi-supervisory personnel, promises to influence the pattern of industrial training for a long time to come.

Included in the TWI curriculum are:

1. *Job Methods Training*—a course designed to promote the fullest use of machines, materials and manpower. Supervisors are taught the four major steps in increasing the efficiency of the operations they supervise: (1) *Break down the job* to include every detail exactly as now done; (2) *question every detail* to determine whether it has a legitimate place; (3) *develop a new method* which eliminates unnecessary details and combines, rearranges and simplifies the necessary details; (4) *apply the new method*.
2. *Job Relations Training*—a course to help supervisors increase their skill in establishing sound relationships with subordinates. Supervisors are taught four vital steps in handling work situations: (1) *Get all the facts* which bear on the question under consideration; (2) *weigh the facts carefully* and *decide* on a course of

action; (3) *take action* at the opportune time; (4) *check results* to determine whether the action taken was appropriate to the situation. The course content emphasizes the fact that a man can be led with ease when he is told how he is getting along; when he is given the credit due him; when he is informed in advance of changes that will affect him, and when his ability is employed to best advantage in the job that suits him.

3. *Job Instructor Training* (Probably not applicable to package development departments).

Organization and activities of the department

The following quotations from responses received give a fair picture of the organization and operation of some of the respondents' package development departments:

"We have a packaging and shipping division included in which is a Container Department, a Packaging Department, and a Supplies Purchasing Department. The Container Department is responsible for the development of all specifications for, and the storage and delivery of all containers. The Packaging Department does the actual packaging work under the specifications as set up by the Container Department and as administered by them. The Supplies Purchasing Department is responsible for the purchase of all packaging supplies under the Container Department specifications."

* * * * *

"This department not only controls package development but also serves as a liaison unit for these departments: sales, sales promotion, purchasing, production, product development, standard methods and shipping.

"The functions of this department are split into four groups, with each group supervised by an assistant department manager. Briefly these four groups are:

- a. Printed package material design
- b. New product design
- c. Package material development
- d. Package material quantity control

"One important unit of our package development department is our control unit. This unit draws up specifications or blueprints for all pieces of packaging material. These specifications or blueprints are supplied to the various sources of supply, and all incoming shipments of packaging materials are sampled and checked against these specifications. By this method, we make sure that the materials delivered comply with our specifications. This unit also issues instructions to our various packaging assembly units, and these two functions serve to assure us that the assembled package will conform to the design that was set up for the package by the package development unit."

* * * * *

"Our Packaging Department operates in two ways. The Efficiency Section constantly works on the problem of simplification and safety of packages, but makes no changes in the size, shape or style without consultation with the Sales and Promotion Departments. Our Sales Promotion Department originates new ideas in packaging with a view to advertising advantages and, in consultation with the Efficiency section, decides upon what is finally adopted."

* * * * *

"The Packaging Engineering Department is organized and set up to do development and research work in materials

testing, estimates, design, shipping tests, materials drawings, art work, the publishing of bills of material, packing processes and standards, etc."

Laboratory and testing facilities may not be available in all cases, but, where they are, they should be closely coordinated with the work of the package development department. Laboratories, in addition to assisting in standardization and accurate cost-finding, in many instances are a prolific source of new packaging ideas which may be worked out in detail by the department.

Packaging committees

Since the purpose of this article is to foster the establishment of package development departments, it is with some hesitancy that an outline of the organization and operation of some packaging committees which apparently work well as a substitute, is included here. One of the questions asked our member companies was, "Do you correlate your packaging development activities with other vitally interested departments?" While one large and successful company confessed that it saw no virtue in this process, the others replied that not only was inter-departmental cooperation an important factor with them but they were able to prove it with concrete achievements. Thus it may be taken for granted that there must be a definite integration of all functions interested in the production and sale of a package.

The following quotations outline briefly the makeup and operation of four successful packaging committees:

"We have no single department devoted to package development. The Packaging Division is responsible for the applied design for all packages, patent and legal information, and all aspects of the package directly influencing consumer acceptance. Our packaging policy is, to a certain extent, established by a Packaging Committee. This committee includes production representatives, as well as members from the Sales, Advertising and Shipping Departments. The committee is headed by our Director of Advertising Operations."

* * * * *

"Our so-called package development department consists of what we know as a Container Committee. This Committee is composed of our quality manager, traffic manager, purchasing agent, production manager, chief draftsman and packaging engineer acting as chairman. After this group has been satisfied by tests and trial runs in our production line, new packages are then submitted to our Sales Department for review and comment and recommendation for printed advertising to appear on the outside of package. It is the duty of the chairman to supervise all tests, trial production runs, to contact suppliers of packaging materials and to attend all packaging conferences, such as those held by American Management Assn. and others.

"We have learned by this method that a very considerable and helpful experience has been gained not only as to design but as to quality of materials used in packages and that we do not have to rely on judgment passed on to us by suppliers. In fact, we have been able to reduce the cost of all packaging materials and shipping containers very greatly. This method of engineering packages has been in vogue with us since 1933. We have a drawing to which has been assigned a part number for every item of packaging material and container that we use. This drawing covers dimensions, quality and weight, type, color, adver-

tising to be printed on container and certain other minute details. A drawing of each piece of packaging material and container is submitted to supplier with each purchase order that we enter."

* * * * *

"All our packaging work, both shipping and consumer packaging, is done by our Packaging Committee. This committee is made up of the following representatives:

Chairman
Packaging technician
One major executive
One representative of the following departments:
Engineering
Production
Experimental laboratory
Sales
Methods
Product testing
Shipping

The contribution of these members is, in general, as follows:

Chairman—Guides the work of the committee, devotes some time to package development.

Packaging Technician—the only man who devotes full time to packaging. Conducts tests, investigates new products, checks specifications, etc.

Major Executive—gives counsel on company policy, contributes suggestions from his experience with the company and the products.

Representative of
Engineering—"Engineering of packages," machinery and design.

Production—"Productability," ease of production, etc.

Laboratory—Tests materials for moisture-vapor-resistance and other laboratory tests.

Sales—"Salability," customer appeal, retailer appeal.

Methods—Production ease, jigs and fixtures, time saving short-cuts, etc.

Product Testing—Because of the nature of our products, all materials used in packaging must be tested for deteriorating effect on the product.

Shipping—"Shipability," safe delivery of product, freight regulations, etc.

"Along with their individual responsibilities as outlined above, the committee teams together on design of all packages. Sometimes, other individuals in the office and factory are called upon for advice and assistance.

"In the development of a new package or in the event of a change in existing packages, the problem may be brought forth by anyone, a salesman, an executive, a factory worker, etc., and is presented to the Chairman of the Committee. The Chairman then presents the subject at a regular Packaging Committee meeting. A discussion is held and the Chairman assigns various phases of development to members of the Committee. For example, the Packaging Technician is assigned to contact suppliers, etc., the Laboratory Representative is assigned to see that tests on materials are carried out, and so on down the list. Thus the development is divided among the members and at the next meeting reports are made and results correlated. The Committee then cooperatively works out a solution. The finished package is presented to the Executive Committee for their approval (*Continued on page 218*)

How to organize a packaging department

by Charles A. Southwick, Jr.

Technical Editor

All users of packaging materials desire to know how new materials fit into their operations and if they are using the most economical, protective, attractive and convenient package material and form. How to secure these facts accurately, effectively and continuously is important today and will be necessary to keep abreast of postwar packaging materials and competition.

The results of brief surveys¹ have shown that this packaging work has been delegated to various individuals or existing departments as a secondary responsibility. Most companies appreciate the need for this work but do not realize its nature and complexity. This activity cannot be done effectively by any individual or department as a secondary responsibility. Packaging is very complex, in the number of physical forms of materials and packages, in the kind and degrees of functions and in the equipment of forming and handling. Furthermore, packaged goods are becoming more complex and require more package protection. Finding the most effective medium for a product cannot be done by a jack-of-all trades when advertising and merchandising factors must be included.

At least one person must have a sound knowledge of package and material functions, knowledge of the product and a scientific background. Other considerations can be obtained from existing personnel in other departments.

Packaging committee

The complete responsibility for package development and control should be given to a committee composed of a person from each interested department. Such a committee would have a member from, be represented by, the purchasing department, the art department, the sales department, the production department, the technical department, the advertising department and if possible, the consumers service department or its equivalent.

It is important to realize that in a small organization one person may represent more than one group, and in a very

¹ MODERN PACKAGING Aug. and Sept. 1913, "Patterns for Packaging Planning" and preceding article "Survey of Current Operating Practices in Packaging Development."

large company more than one person may represent each department. The important thing is to have representation of each phase governing packaging from its beginning to the consumer. No decision is sound unless all factors have been considered and analyzed as to their effect on the whole.

Each member or department must have data and knowledge of packaging considerations as they affect their own operation. Also each department will require data from other departments to operate properly. The following are a few examples of what each department contributes and what its makeup requires.

Purchasing department

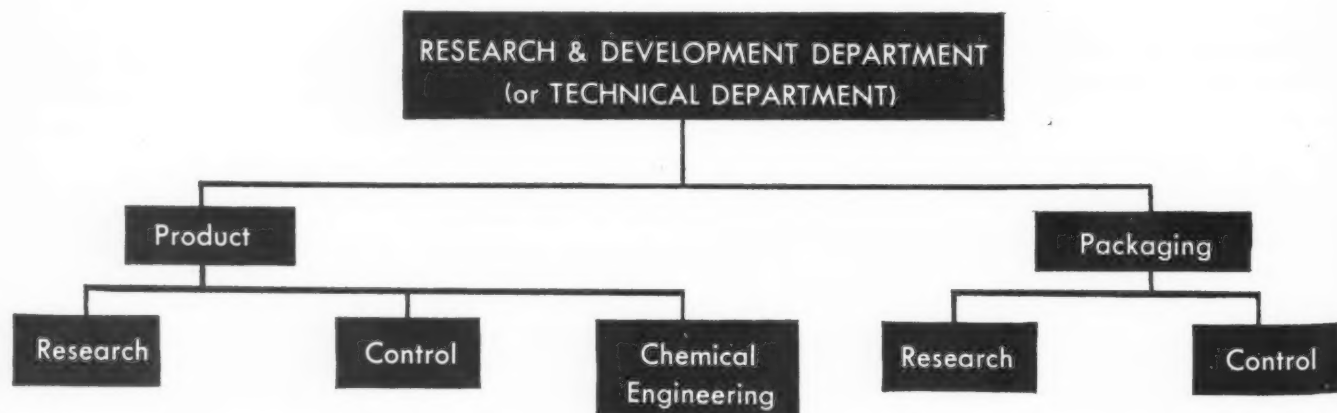
This group has knowledge of material and package costs, availability of materials and where to obtain samples and production needs.

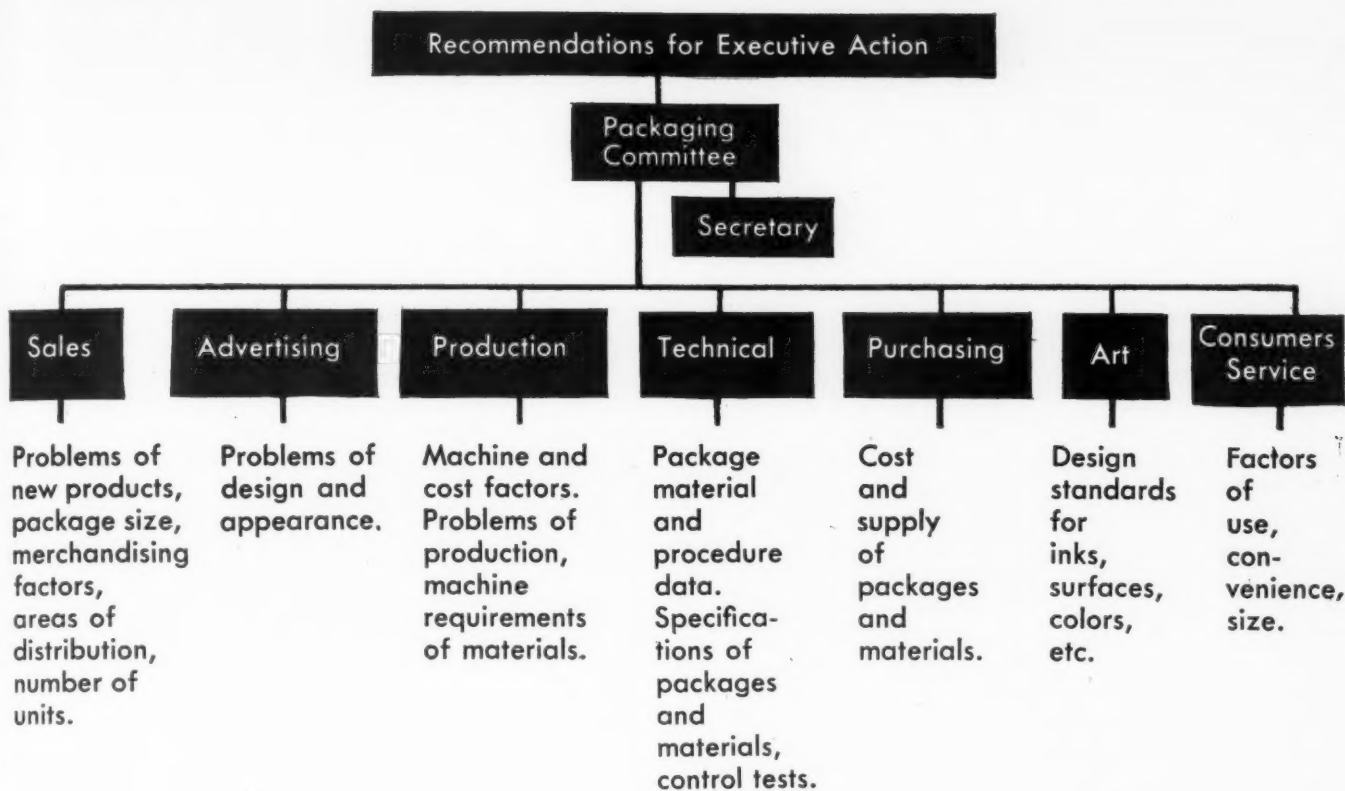
The purchasing department must be given specifications by the production, the technical and the art department for the materials, packages and equipment to be obtained. The purchasing department should never be allowed to buy on price alone. Competitive products can be tested and approved before purchasing.

Art department

This activity may be performed by an outside designer or by someone in the company. In either case, its scope should cover the printing and other decorative phases of packaging. It will cooperate closely with the advertising and technical departments to satisfy the needs of each.

In many cases protective qualities can be combined with decorative and these must be tested and approved by the technical group. The art department must not decide upon the package materials but must use those found suitable by the technical department. The art department should then write specifications for inks, type of printing, etc., and the grade and surface required. They should also set standards of color and quality for the guidance of the production department in making up the finished package.





Sales department

This department supplies most of the problems as a result of its needs for new products, new packages for old products, changes in merchandising and competitive activity.

It should furnish the facts on the ways and channels of merchandising, the rate of turnover, the areas of distribution, etc. The committee work is primarily to satisfy the demands and needs of this department.

Production department

This group must package the product effectively and efficiently in the equipment, form and in the materials decided upon by the committee. This department, for its own protection, must cooperate with the technical department to set up standards of operating characteristic and control tests. These production specifications on both materials and finished packages are important for low cost operation, reduction of loss of materials and for a uniform protective package.

This department knows the limitations and productive capacity of its existing packaging equipment which is a very important factor.

The technical department and production department must cooperate closely on product changes and control, on package and material specifications and on the control of finished and filled packages.

Advertising department

This group supplies the facts on the style and decorative phases and the package relation to other products and the advertising program.

Consumers service department

Whatever the name, this group should represent the consumers' requirements and viewpoint. The problems of size, opening devices or other conveniences, how the product is used and

many more can be presented by this department. Such data and opinions may be formed by surveys and by a consumers' kitchen. Representation of this sort on the package committee is important and necessary, but is very often forgotten.

Technical department

It is the responsibility of this group to supply facts, data and similar objective information for the committee's consideration. The technical department must have laboratory facilities and personnel assigned entirely to packaging problems to operate effectively. It must cooperate with the technical groups doing product research development and control and work closely with the production and purchasing departments on specifications and control of packaging materials.

This group is necessary to indicate the materials and package forms which can be used for any package problem. The equipment, methods and personnel of this department will be described later in more detail.

The packaging committee should be composed of one person assigned from each of these departments. It is preferable that the same person attend all meetings unless the company is so large that some departments would send different people for different groups of products. This could happen in sales or advertising, but it should not happen in production, purchasing, consumers or art departments and it must not happen in the case of the technical department.

It is better to assign a permanent member from each group and to call before the committee other persons particularly concerned with the problem in hand.

The committee should have a secretary whose duty it is to report the facts and opinions presented and the final conclusion of the meetings. Obviously, as many packaging materials, designs and forms as appear practical, together with cost and production data, should be reported to the executive group for final decision.

The packaging committee should meet at the same time each week with special or task group meetings whenever

required. The sequence of committee operation could be:

The member from the sales department presents at a committee meeting the problem of packaging a new product just developed by the research department. Next the product is described, its chemical and physical properties are given by a member of the research department called to this meeting as a special witness. The sales department then describes where and how they would like to market the product. The consumers service member tells how the product is to be used in the home. The technical department member of the committee is then assigned to get samples of the new product, find its special packing requirements, make package tests and recommend materials. This concludes the discussion of the product at that meeting. The following week, at the next meeting, the production department presents facts on the cost of the product, the sales department tells the sizes of packages they require, and consumers' service adds facts on home uses.

The technical department meanwhile has determined some of the products' characteristics, but does not have package data. At subsequent weekly meetings some additional data are accumulated, but no serious discussion occurs until the sixth meeting when the technical department presents the results of package tests. This report covers several package forms and a variety of material combinations. These sample packages have been exposed to deteriorating influences both physical and chemical. The conclusion shows certain product characteristics which allow the committee to decide upon a type of package and a level of protection.

The art department is given the task of color, design, etc. The production department then is assigned the task to survey the cost of new equipment and other factors while the technical department makes additional tests of a greater number of material combinations of the approved package form. These results are reported in six weeks (the 12th meeting from the start of the problem). At this meeting the three best package combinations are turned over to the art department for samples in the colors and designs which have been tentatively approved. The purchasing department and production department are given tentative material specifications both mechanical and chemical to obtain costs. The production department also reports on the necessary equipment for production of the yearly quantity estimated by the sales department. Meanwhile the technical department has started another series of tests for confirmation and more complete data.

At the 14th weekly meeting the complete report giving recommendations, designs, costs, specifications is presented for final decision by the executive group of the company. Actually this is a rather simplified procedure, but it is a pattern for the proper sequence and operation of such a fact finding packaging committee.

The final decision is made from laboratory test data, sales and advertising requirements, cost considerations, manufacturing needs and appearance and convenience factors. All these elements are present in every package change and each must be weighed as objectively as possible. Here is a proved way to eliminate guesswork in rational packaging.

Importance of the technical department

The most important single source of data and facts concerning package and material functions is the scientifically trained group, the technical department. Depending upon the size of the company and the amount of work to be done, this department can vary in size from one person to a large staff. The important fact is that all scientific phases of packaging

should be assigned to one individual and this person should be given laboratory facilities and personnel devoted entirely to packaging work. It may appear that undue emphasis has been placed on specific assignments of technical personnel to packaging problems. This point is emphasized because in too many cases packaging problems are given at random to personnel and laboratories without special skill, experience or equipment to produce proper data and interpret the results. Package testing requires special knowledge and facilities, and those are not present in usual laboratory setups. Aside from facilities, it is equally important that the technical department have some person who has developed a background of experience to interpret properly and report the laboratory findings.

Unquestionably these facts would be better appreciated if package testing were being done according to arbitrary and exacting standards promulgated by an official group. Until such standards are issued and in effect, we can expect package testing to be done on makeshift equipment, under many conditions of control and with widely varying systems of reporting results.

Certain phases of packaging can only be handled on a scientific basis, and it is unfortunate that the science of packaging has remained in the embryonic state for too long. There must be a rapid appreciation of this fact if we are to use, quickly and effectively, the many new materials and combinations which will be available for postwar packaging. It will be impossible to evaluate the usefulness of such materials except by comparative tests skillfully done and soundly interpreted. No company can afford to ignore this fact and so allow its packages to become obsolescent and inefficient.

A packaging laboratory

A well staffed and equipped packaging laboratory should be responsible for a continuous flow of material and package test data to the packaging committee. The pattern and scope of this activity should cover the following phases:

- I. Currently used packages and materials.
 - A—Control tests against specifications on—
 1. Package materials purchased
 2. Packages as purchased
 3. Components for package use
 4. Finished and filled packages from production lines
 5. Unit machine operations in package manufacture or handling
 - B—Comparative tests of currently used packages, materials and equipment against—
 1. Competitive packages
 2. New packages and materials offered by prospective or present suppliers
 3. Newly developed components or materials capable of similar function
 4. New or improved equipment
 - C—The responsibility for proper sampling and control technique.
- II. The development of specifications of currently used package materials and components.
 - A—Complete mechanical specifications for package components—
 1. Of strength and durability factors
 2. Of weight, area and yield factors
 3. Composition and identification
 - B—Complete chemical specifications—
 1. Of permeability values
 2. Of resistance to penetration and affect by various agents

(Continued on page 222)

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We are as anxious for peace as any human beings—and as businessmen, so we can put what ingenuity and resourcefulness we may possess back to work on the peacetime problems of the mass packagers of drugs, cosmetics, cigarettes and the like, who are our long-time customers.

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CORROSION

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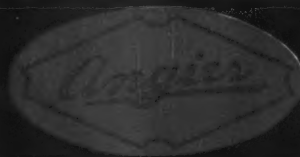
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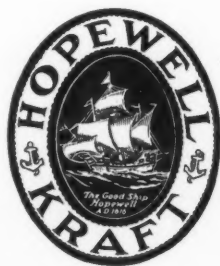
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THE daily news reports tell how tough they are. Whether they fight in Italy or on the South Pacific, they've got what it takes. And where the going is toughest, you'll find strong fibre board boxes made of Hopewell Kraft right out in front.

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You'll find these Hummel-Ross products better for the lessons learned in these war-time days. New products—new uses for old products—tough plastic bases, all proud to bear the trade-mark, "Hopewell Kraft".

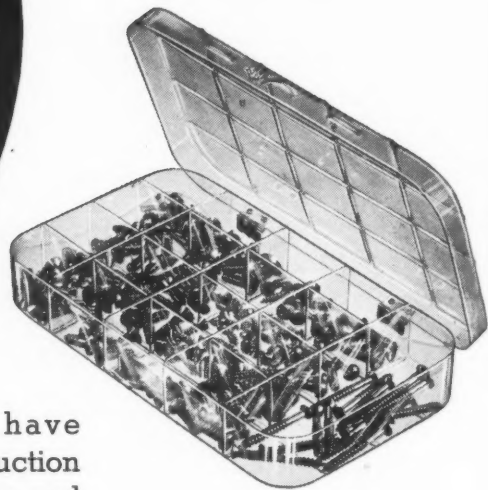


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Production facilities are ample to handle large orders. Prices and samples will be sent on request.

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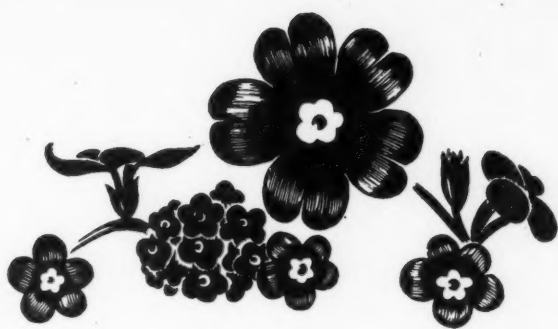
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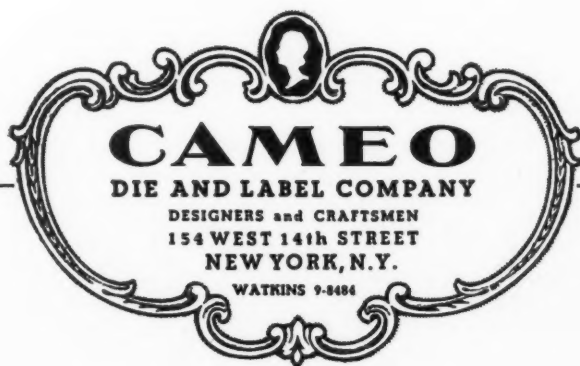
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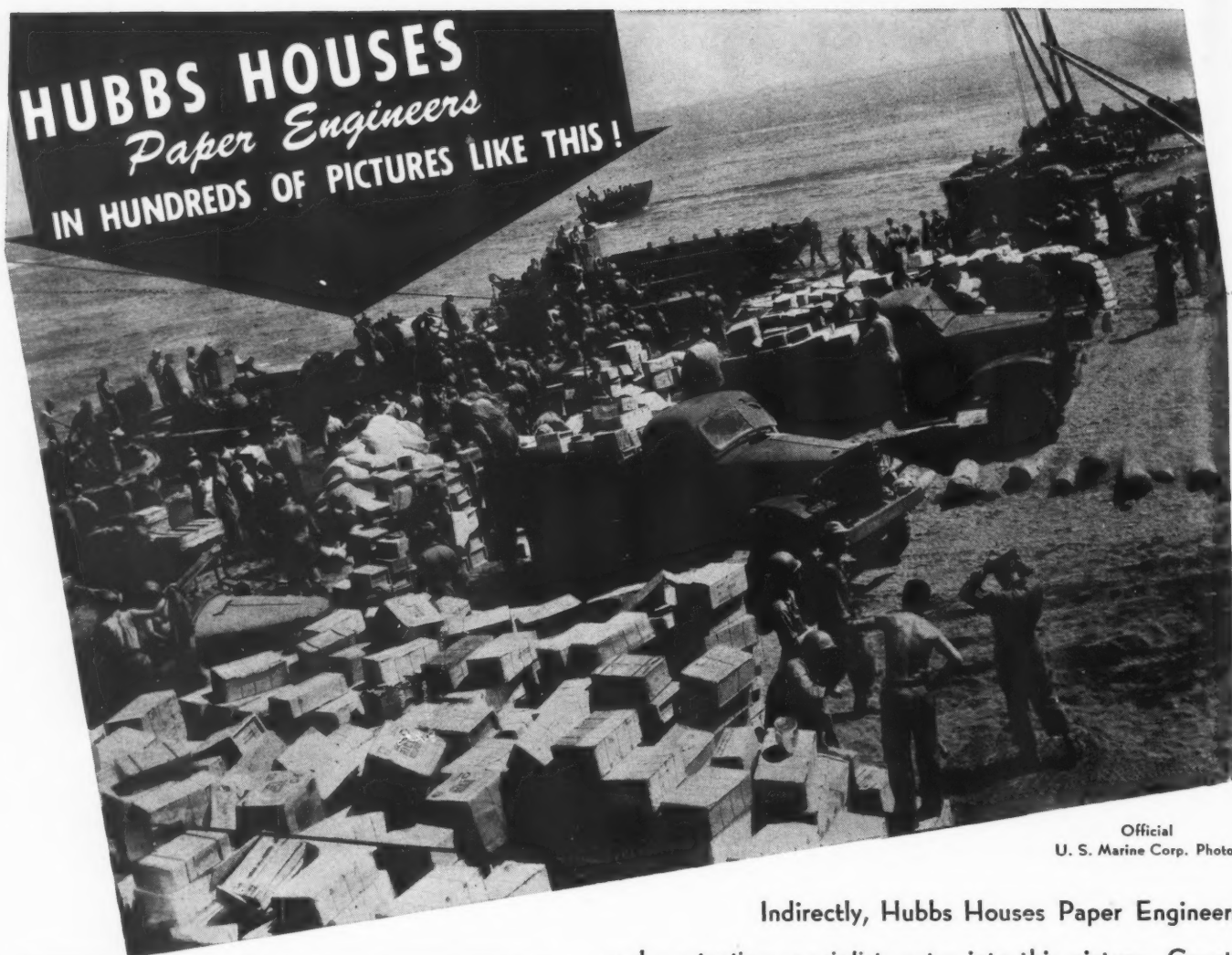
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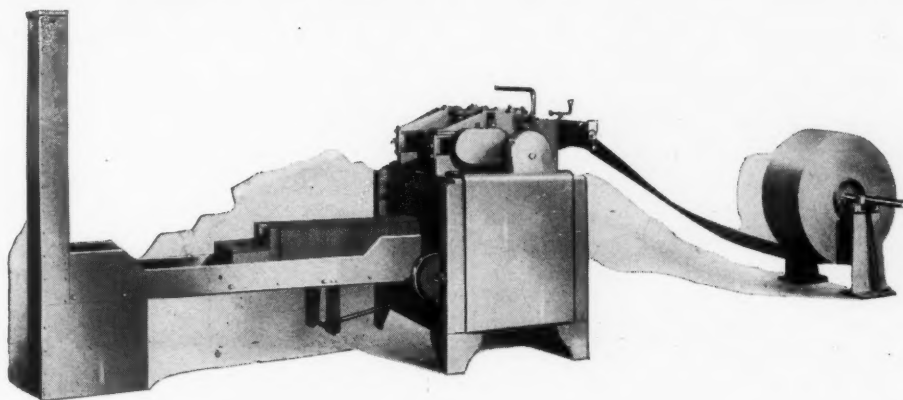
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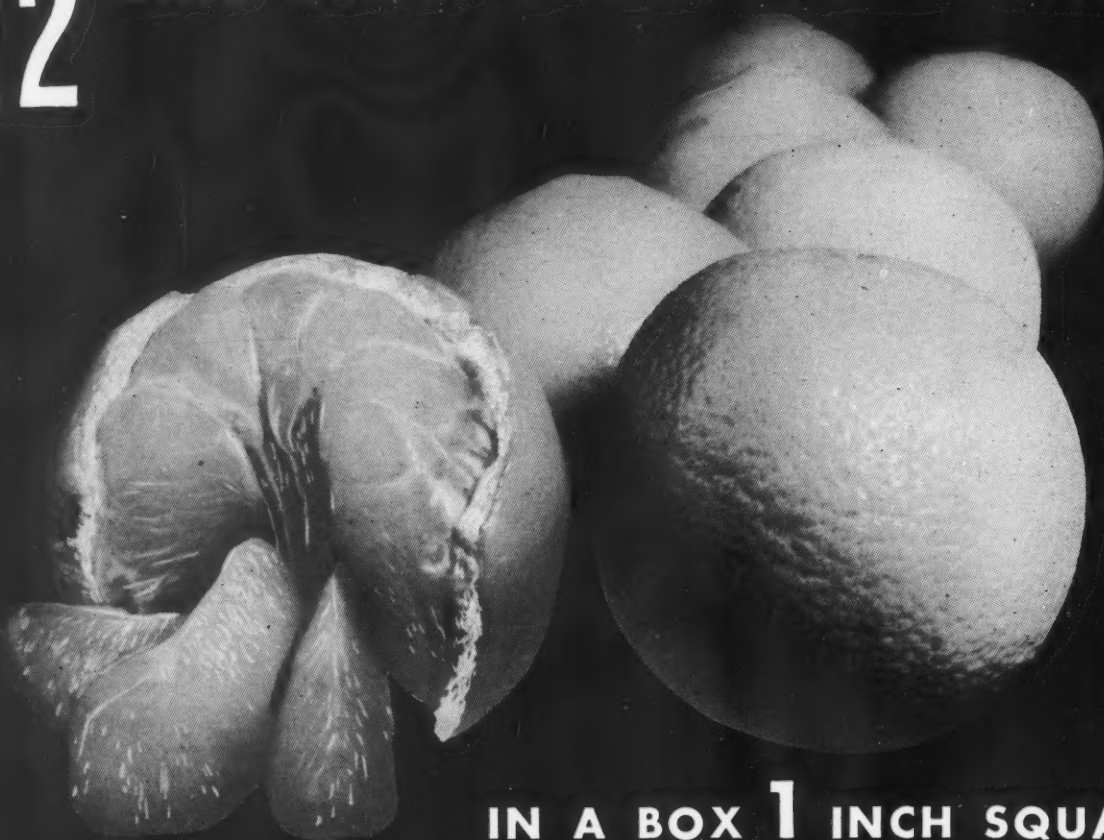
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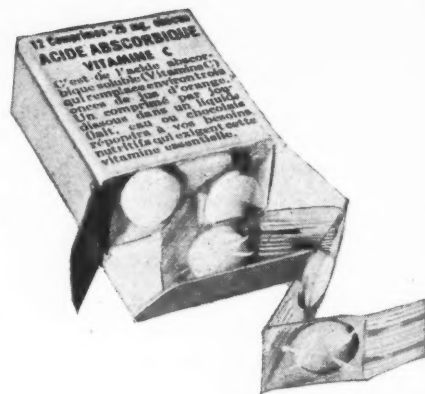


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CHARLES A. SOUTHWICK JR.



Bright future for vinyl resins

by Allen F. Clark*

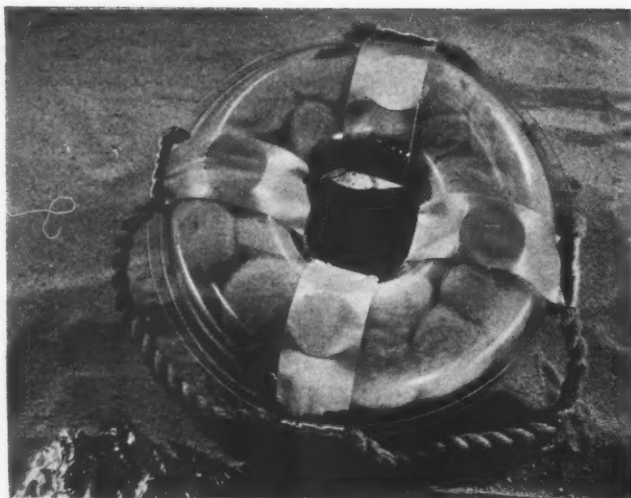
An American soldier, walking along a hot beach in New Guinea, picked up a small package of coffee that had been washed up by the surf. There was no way of telling how long the package had lain there, but it was apparent from its appearance that it had been completely immersed in salt water for some time. The soldier made a perfect brew from the coffee in the package—the water, the handling, the sun, and the heat had all failed to break the package and ruin the contents in any way.

Wartime packages are designed to withstand such severe treatment. The unusual part of this incident was that this package was almost exactly the same as coffee packages in

use years before the war, yet it had withstood mistreatment never dreamed of in normal commercial operations.

The coffee package was made from aluminum foil coated on both sides with a waterproof vinyl resin and reinforced with a waxed paper sheet, Fig. 1. The vinyl resin coating used on the aluminum foil is representative of many similar coatings found useful by the packaging industry. They are, however, used in a variety of other ways. One of the most versatile groups of plastics ever developed, these resins are produced as rigid and elastomeric molding and extrusion materials, and in standard shapes, such as sheets and sheeting and film. The resins are also dissolved in a solvent to produce coatings for metals, paper and textiles, and to produce ad-

* Carbide and Carbon Chemicals Corp., New York.



hesives of several types. They can also be coated on textiles by calendering.

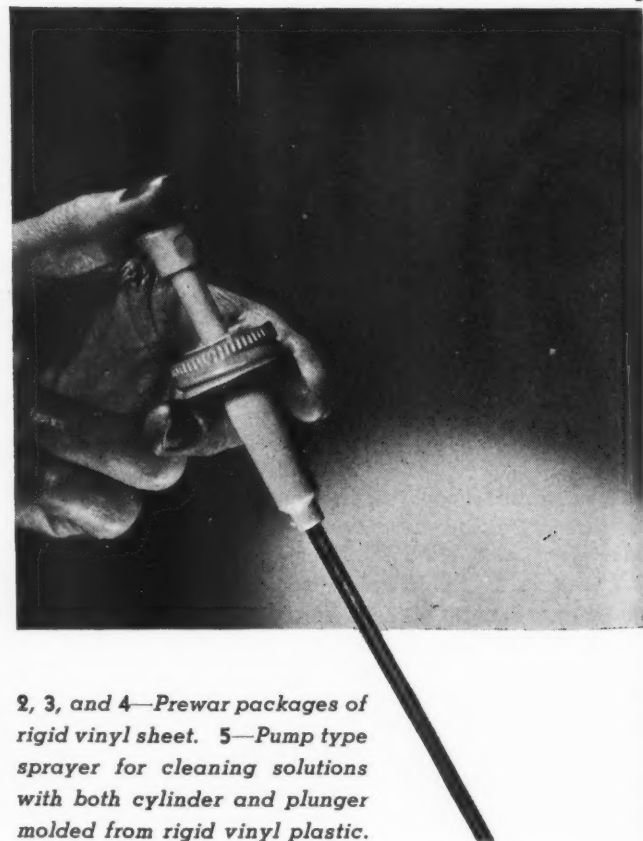
This range of useful products is not produced from a single resin. In the strictly technical sense, the classification of vinyl resin can be used to define six or eight basically different chemicals. Under the usual interpretation, the vinyl resin grouping covers the polymers of vinyl chloride, vinyl acetate and vinyl butyral, and the copolymers of vinyl chloride-vinyl acetate. However, even this restricted classification covers almost a dozen different resins as it is practical to control the polymerization reaction to secure resins of different molecular weights, and it is also practical to combine vinyl chloride and vinyl acetate in varying proportions, again with different molecular weights in these proportions. Going one step further, these resins can be used with or without plasticizer to provide rigid materials or materials with varying degrees of elasticity, and some of them can be used with fillers to produce still different materials. Each of the different resins and each of the formulations will differ from the others in one or more physical properties or in methods of use.

Among the most important of these resins are the copolymers of vinyl chloride and vinyl acetate. It is this group of resins that is used most widely in packaging. This is the group that yields superior elastomeric compounds which can be used in many of the same ways as rubber but have many distinctive properties and applications.

With such a wide range of materials available, it would be impractical to give physical and chemical properties for the group in detail. The best procedure for a designer is to outline the requirements of his design to his elected supplier. Then, this supplier can meet these requirements with the most satisfactory resin processed in a suitable manner.

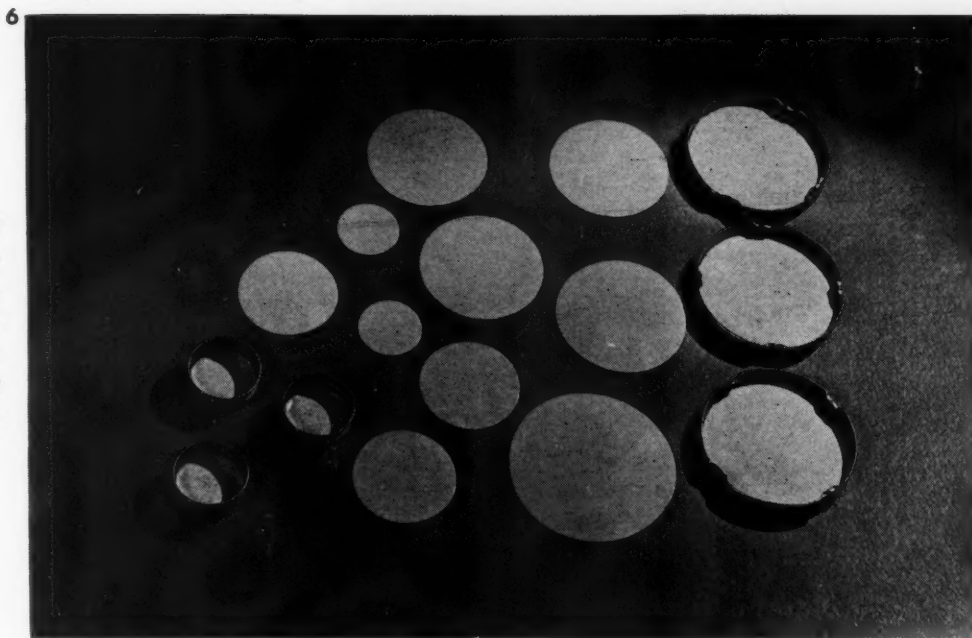
In general, the properties of vinyl resins are as follows:

1. Odorless, tasteless, and non-toxic.
2. Non-oxidizing (aging), sunlight resistant, and non-



2, 3, and 4—Prewar packages of rigid vinyl sheet. 5—Pump type sprayer for cleaning solutions with both cylinder and plunger molded from rigid vinyl plastic.

6—Vinyl resin-coated paper and caps. 7—Resins on metal result in a clear alcohol-resistant coating for beer cans. 8—Vinyl-coated paper food containers must be water- and greaseproof and able to take a heat seal.



flammable to slow burning, depending upon the plasticizer used.

3. Strong, tough abrasion resistant, and resistant to continued flexing.
4. Non-warping, and unusual dimensional stability.
5. Extremely low water absorption and moisture-vapor transmission through films.
6. Resistant to the effects of: Mineral acids; sodium and potassium hydroxides; iodine and chlorine water or tinctures; alkalies; alcohols and polyalcohols; aliphatic hydrocarbons—but not the aromatics; oils, fats, and waxes—animal, vegetable, or mineral.
7. Soluble in ketone solvents.
8. Excellent electrical properties.
9. Thermoplastic, can be formed, drawn, laminated and bonded under heat and pressure.

Vinyl chloride-acetate resins were used in packaging shortly after they were first introduced to industry, and early applications have been discussed in MODERN PACKAGING in August 1940 and in November 1941. These designs were eminently successful; those that have been discontinued were stopped only because the type of package was superseded during the war—extensive war needs supersede all except the most essential package needs.

The most pleasing of these early packages, from an appearance standpoint, were those fabricated from rigid sheet stock, Figs. 2, 3 and 4. The sheets themselves are produced in clear, translucent or opaque forms with either no coloring matter added or in a wide variety of colors. This sheet stock can be drawn, swaged or cupped satisfactorily by either the "wet" or "dry" method. It can be formed by wrapping around mandrels or by blowing in the same manner that glass and certain other plastics are blown. Sheet stock can be given uniformly glossy or dull surfaces by pressing the sheets between planishing plates which have the desired polished or matte-surfaces.

Standard plastic molding and extrusion processes are used to form the resins into shapes not obtainable through the use of sheet stock. An example is the sprayer shown in Fig. 5. Both the cylinder and the plunger are molded from rigid vinyl plastic. Clearance between the two parts is 0.001 in., and at the first point of contact there is a considerable amount





of side thrust. Under test, these sprayers were operated 500,000 times, yet there was only a slight drop in efficiency. The tube which extends down into the liquid being sprayed is extruded from an elastomeric vinyl resin compound. It successfully withstands the action of isopropyl alcohol and the oils which may be used in cleaning solutions.

Another type of application for vinyl resins and one which has found an expanded place during the war, is the use of these resins as coatings on paper or metal. Paper coated with vinyl resins has proved to be an efficient liner material for bottle and jar caps, Fig. 6. Here the oil and chemical resistance of the resins is a valuable attribute. The caps, punched from the resin-coated paper, are produced in a variety of types. When the resins are placed in solution and coated on metal, the result is a clear, alcohol-resistant coating that has been used widely in beer cans, Fig. 7.

A hermetically sealed vinyl resin-coated aluminum foil package, like the coffee package picked up on the New Guinea beach, was used in prewar days for packaging cream cheese. It is being used today for carrying powdered coffee and dehydrated fruits to our fighting men in all parts of the world. These packages stand up satisfactorily under all conditions from freezing subarctic temperatures to steamy, humid tropics. This same type of unit is now being used commercially for packaging citrus fruit powder, Fig. 1, and experimentally, as a cover for chocolate with good results.

Wartime shortages of critical materials, and the urgent need for many unusual types of packages accelerated the use of various vinyl products in this field. Cap liners and can linings were, of course, continued. (A new type of cap which utilizes vinyl resin-coated paper as a liner, the ring-and-disc vacuum closure, was described on page 76 of the December MODERN PACKAGING.) When wartime needs restricted the use of black iron for cans and closures, interest shifted more and more to the possibility of paper containers. For economical production, a coated paper for food packaging, Fig. 8, must be capable of being heat-sealed, in addition to being water- and greaseproof. Vinyl thermoplastic resins meet all of these important requirements. Surfaces can, in effect, be welded through use of heat and moderate pressure.

For wet foods, one of the most promising paper containers developed so far is of the bag-in-box type. This is actually two containers, Fig. 9, the first being a heat-sealed water- and greaseproof paper bag made from vinyl resin-coated paper placed inside a strong cardboard box which provides the necessary rigidity and strength. This type of construction has been used successfully for shipping malt syrup. It is being tested for dehydrated and quick-frozen foods, although in packaging the outer cardboard box may be omitted.

In packaging most dehydrated foods, still another problem, that of moisture vapor transmission, is encountered. It is an interesting fact that many materials which are completely waterproof will still permit the transmission of some water vapor. Where absolute minimum water transmission is required wax is incorporated in the vinyl resin film, or a two-ply construction, with a waxed paper bonded to a resin-coated paper, may be used.

An important use of vinyl resin-coated paper is the package for sulfanilamide which soldiers carry into battle. Each

9—Bag-in-box type container especially good for wet foods. 10—Sterilization with live steam will not loosen heat-sealed bond of sulpha package. 11—Vinyl-resin coated cloth makes the package for the fluorescent dye which aviators carry to stain the water when forced down.

dose of this drug is wrapped in a separate heat-sealed paper envelope, Fig. 10, coated on the inside with the resin. This coating was chosen because it heat-seals well, is tough, completely waterproof, and non-toxic. Sterilization with live steam will not loosen the heat-sealed bond.

Protection for workers on the home front is afforded by milk bottle hoods, also made from vinyl resin-coated paper. These hoods are fed to a special applying machine, flat, directly from the shipping tubes in which they are received by the dairy. In the conditioning oven of the machine, each hood is exposed to 500 deg. F., a treatment which sterilizes each cap. This conditioning also makes it possible to shape the hoods and heat-seal them over the top of the bottle. In order to remove the hood the seal of several side pleats must be broken. Although the hood cannot be taken off without detection, it retains sufficient of its hood shape so that it may be used as a temporary protective cap.

The use of vinyl resin coatings on cloth resulted in still another type of package. This package, Fig. 11, holds the fluorescent dye which aviators forced down at sea can use to stain a large area of the water to facilitate rescue. It is essential that this dye remain in good condition until rescuers are close enough to see the staining on the water, so the package had to be completely waterproof. All seams on the packet are secured by heat-sealing, and means are provided to rip the packet open in a second.

In all of the foregoing applications the vinyl resin had been used as a coating on paper or textiles. Many other interesting packages have been made from unsupported film. For example, Army rifles are packed inside envelopes made from these films and the edges are heat-sealed. Similar waterproof and greaseproof packages protect other ordnance against damage during shipment.

These applications are only indications of the future of vinyl resins in the packaging field. New developments are being made constantly, and it is possible that the package forms which will be used after the war will be entirely different.

As an indication, a method has been developed for producing a new type of thin, unsupported film of vinyl plastic which shows promise as a coating for paper and cloth and as a heat-sealing, waterproof packaging material, Figs. 12 and 13. As a cloth coating medium, these films appear to offer certain advantages over the conventional coatings, especially where light weight must be combined with a high degree of water resistance. The films will provide a packaging material which is virtually unaffected by water and oils. The moisture-vapor transmission varies with the thickness and composition.

In addition, adhesives made from vinyl resins can be used to form positive waterproof bonds between a wide variety of materials, including many non-porous metals. These cements are being used regularly by industry in general, but have not, as yet, been widely applied to packaging.

Although considerable research has taken place on vinyl plastics as packaging materials, this group of resins have never been explored completely. At the present time, neither the packaging designer nor the plastic engineer has time to lean back and think of distinctive packages, new materials, or of the radical changes in packages that the newer materials make possible.

12 and 13—A new type of thin, unsupported vinyl plastic which shows promise as a coating for paper and cloth and as a heat-sealing, waterproof packaging material. Said to be light in weight, virtually unaffected by water and oils and to have high degree of water resistance.



DRY-ICE CONTROL

New method of refrigerated packaging may extend market-areas of perishable products

A new method of packaging with dry-ice refrigerant provides a high degree of temperature control and promises to have important applications to many highly perishable products.

The method, tested in the technological laboratory of the Fish and Wildlife Service, Department of the Interior, has been applied on a commercial scale and pronounced highly satisfactory in long-distance shipment of fresh, unfrozen, fish fillets. It has also been used successfully on unstable products as varied as orchids and ice cream.

Secret of the package is in the use of special insulating pads in a paperboard container, and their placement in such a position as to give maximum protection to the product and avoid hard freezing and burn which results from close contact with dry ice.

Principal ingredient of the insulating pads is buckwheat hulls, a cheap, waste product resulting from the milling of buckwheat. The dry, light hulls are thickly coated on a sheet of kraft paper which has been heavily coated with an asphalt compound. Pads composed of six to 14 layers of the resulting material are found to have unique qualities of insulation.

Research and development has centered around a complete shipping unit designed to transport 40 lbs. of fresh fish fillets. This package has been used for the last several months by the Atlantic Coast Fisheries Co., of Boston, with such results that officials of the company expect to adopt it to the full extent of availability of materials. Fillets have been shipped regularly, in hot weather and cold, to points as distant as Kansas City, arriving in excellent condition.

According to H. F. Robinson, production manager of Atlantic Coast Fisheries, customer reaction has been highly favorable. One dealer reports that fish received in this container are of such superior quality as to be worth two cents more per lb. Altogether, between 70,000 and 80,000 lbs. of fish have been shipped in the new package to date.

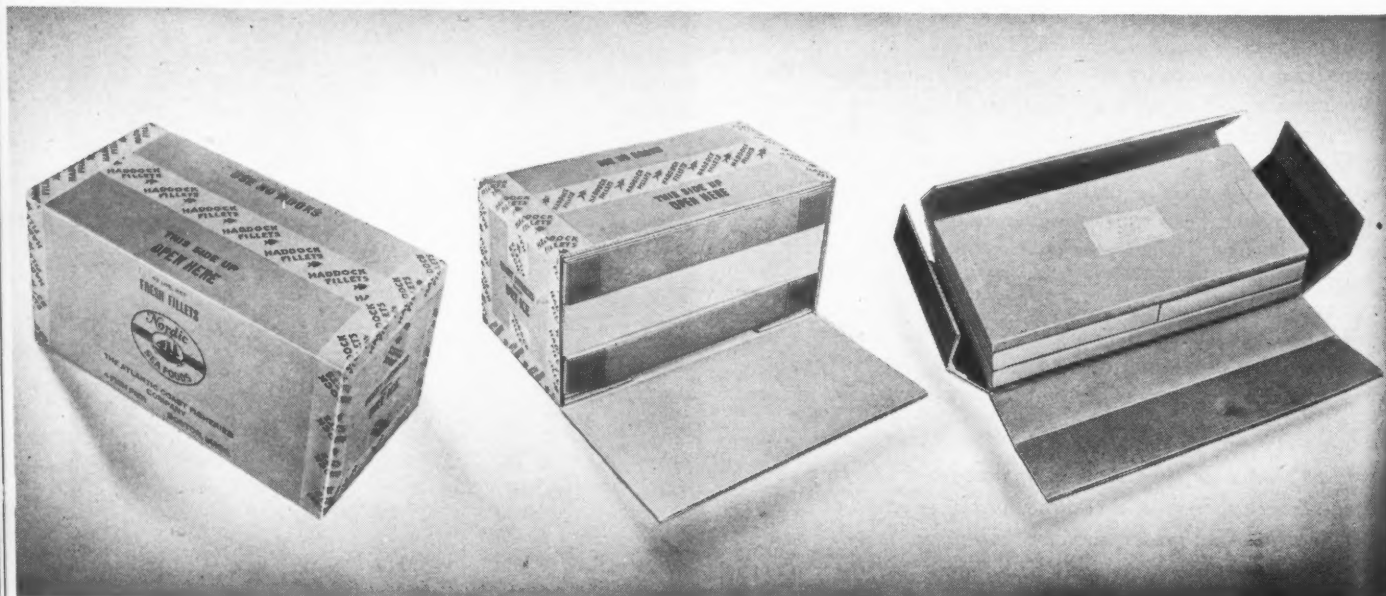
Proper preservation of fresh fish in transit has been one of the most troublesome of all packaging problems. It is essential not merely to prevent spoilage, but to preserve the delicate flavor of the fish, and this can be done only within a narrow range of temperature. The fillets are particularly susceptible. Thus, the fresh fish fillets were deliberately chosen for a scientific trial of the dry-ice package on the theory that this would provide the severest possible test of protective qualities.

Previous shipping packs for fish have been tin-coated steel boxes—or more recently heavily wax-coated fibre boxes—overpacked in wooden cases with large quantities of crushed natural ice. Shipping distance was definitely limited by the life of the ice; the box was heavy, often leaked and was not desirable as airplane cargo.

Previous experiments with dry ice had not been successful because the fish froze solid, "burned" and suffered serious impairment of flavor. The Fish and Wildlife Service now states that results of its investigation definitely indicate the success of the new dry-ice package.

Atlantic Coast Fisheries is using one of the first package setups approved by the Government laboratory. This box is shipped in refrigerated cars and trucks, as the natural-ice boxes have been, and requires less than the maximum of

1—Corrugated setup with dry ice and insulating pads keeps 40 lbs. of fish fresh as long as 4 days. Left, completed shipping unit; center, packing arrangement with fillet boxes top and bottom, "ice box" in the middle; right, makeup of ice box with insulating pads top and bottom, two wrapped dry ice slabs between.



dry-ice protection. Further testing by the Government researchers has resulted in a slightly modified package which will hold fillets satisfactorily for upwards of 48 hours with 28 to 34 lbs. of dry ice, under normal, outside temperatures of 75 to 90 deg. F., which is the critical temperature range for fish.

The improved package, designed for non-refrigerated shipment in railway express cars and airplanes, weighs only 72 to 78 lbs. gross. Outside dimensions are 23 by 12 by 12½ in.

With assured protection of the contents for at least 48 hours, it is obvious that the distribution of such products as fresh fish can be extended from the seaboard to reach every point of the interior. With the present bulky, heavy and sometimes leaky natural-ice containers, the shipment of fresh fish fillets over a very limited area amounts to 150 to 200 million lbs. yearly. The possibility of expansion of this business with the new package is obvious.

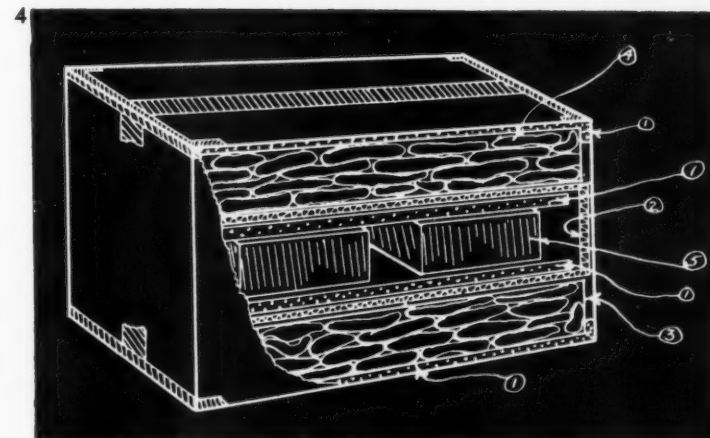
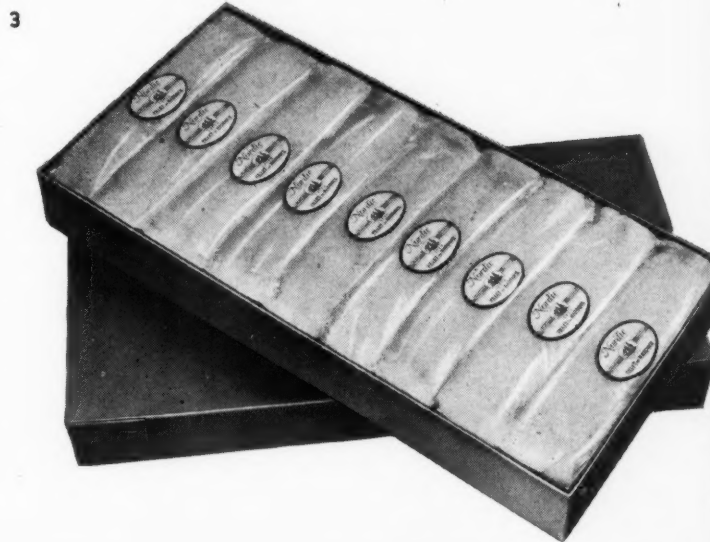
Robinson states that higher cost of his dry-ice package is more than compensated for by the reduction in gross weight and consequent saving in shipping charges. Furthermore, there is no shrinkage of weight in transit and the condition of the fish on arrival, as compared with the same fish shipped in the wet-ice container, is so superior that they will bring \$1.00 or more per box extra in a competitive market. Robinson's package has some weight advantage, in that it uses only 15 lbs. of dry ice and has a gross weight of 59 lbs. It is one inch shallower than the box later developed, but dimensions otherwise are identical.

According to Gustav Merkle, of Philadelphia, a former baker who is the inventor and manufacturer of the buck-wheat-hull insulating pads, the principle had its first application several years ago in the bulk packaging of ice cream. Several of the country's largest ice cream manufacturers adopted the new insulating pads and used them briefly in their larger-sized home-delivery packages, until ODT rules halted home delivery of ice cream because of the shortage of packaging materials.

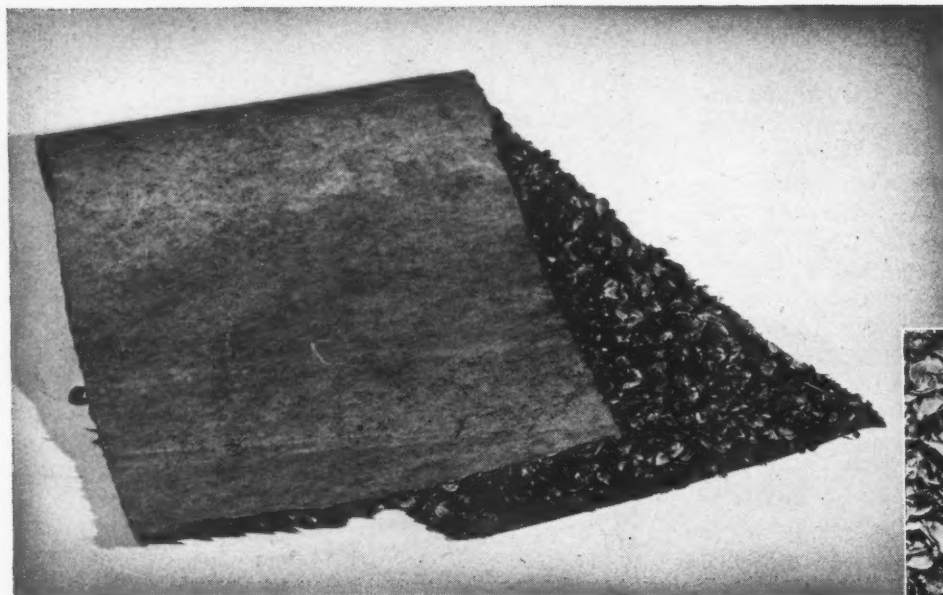
Previously dry-ice packing had frozen the ice cream so hard that it was necessary for the consumer to open the package two or three hours before serving to let it soften to the point where it could be cut. With the Merkle "control pads," it is claimed, this over-freezing was avoided, yet the container could be kept at room temperature for 50 hours, with the ice cream ready to serve at any time. Consumer reaction is said to have been highly favorable, and this package appears due for a comeback after the war.

The current paper shortage, of course, definitely limits use of the new method for any product. Few of the fish-fillet packers who would like to use it will be able to obtain sufficient pads and cartons for some time to come. Nevertheless, packages have been designed and tested for such products as orchids and other cut flowers and greens, cut chickens, fresh sausage and live lobsters. A multitude of other applications suggest themselves for testing and ultimate use after the war.

The dry ice (solid carbon dioxide) gives off carbon dioxide



2—Packaging is on assembly-line basis at Atlantic Coast Fisheries. 3—Fillets are cellophane-wrapped, closely packed. 4—Improved Government package has 4-ply insulating pads (1) top and bottom, folding over at the ends. Pads in the ice box are 6-ply rigid at bottom, 2-ply flexible at top. Corrugated folder is shown (2), air space (3), fish (4) and two 14–17 lb. slabs of dry ice (5).



5

5—View of a single ply of insulating material, showing the kraft backing to which asphalt and buckwheat hulls adhere. 6—Close-up showing the texture of the material.



6

gas which gradually fills the air spaces of the sealed container. In most cases—and especially so in the case of fish—it is distinctly beneficial and adds to the protective qualities of the package. Carbon dioxide acts to inhibit bacterial growth. The fish fillet box is, in fact, specifically designed to take advantage of this carbon dioxide “envelope” which is formed around the inner fillet boxes.

At the Atlantic Coast Fisheries, the fillets are individually wrapped in cellophane and packed tightly in the fillet box, which is a slightly waxed, solid fibre, telescope-type box about $2\frac{1}{2}$ in. deep.

The master container is then prepared as follows: The double-walled corrugated container, which is received flat from the manufacturer, is set up and taped. An extra thickness of corrugated board is placed in the bottom of the box; then one 20-lb. box of fillets; then the “ice box” setup containing the dry ice and Merkle pads; then the second 20-lb. box of fillets and finally a corrugated sheet on top. This makes a firm pack to the top level of the container. Flaps are then closed and all edges and openings sealed with heavy 3-in. gummed tape, completely sealing in all of the carbon dioxide gas.

Advance preparation of the “ice box,” which forms the center half of the package’s contents, is as follows: The insulating pads are received wrapped and sealed in kraft paper, as are the $7\frac{1}{2}$ -lb. cakes of dry ice. The refrigerator box is a sheet of light-weight corrugated which is received flat and is easily folded to cover the contents on all sides. Loading of this cooling unit has been carefully worked out to give the desired results. Atlantic Coast Fisheries uses a flexible 14-ply insulating pad on the bottom; two $7\frac{1}{2}$ -lb. cakes of dry ice, side by side, in the center, and a 6-ply flexible insulating pad on the top. The dry-ice cakes are specially cut to size so that they will fit uniformly over the pad surfaces.

Dimensions of the outer and inner containers, proper distribution and amount of the dry ice and the proper amount of insulation to keep the fish from freezing, all were the subject of months of experiment and testing at the College Park laboratories of the Fish and Wildlife Service. Participating

actively in the experiments were representatives of the Container Corp. of America, the Merkle Corp. and the Atlantic Coast Fisheries. The latter company made many test shipments of boxes loaded in various ways, and the laboratory made hundreds of tests by means of thermocouples placed inside the package.

The shipping unit holding two 20-lb. packages of fillets was decided upon from the start as being most satisfactory from the standpoint of general trade practice and ease in handling.

Fillet boxes were constructed of lightly waxed fibreboard $\frac{1}{16}$ in. in thickness. Inside dimensions of these boxes are $21\frac{1}{4}$ by $10\frac{1}{4}$ by $2\frac{3}{4}$ in., as contrasted with the conventional 20-lb. tin fillet box which is 15 by $10\frac{1}{2}$ by 4 in. The longer and shallower fibre fillet box was selected in order to obtain more rapid cooling of the fillets and more uniform temperature.

Inside measurements of the “ice box” finally adopted are $21\frac{9}{16}$ by $10\frac{5}{8}$ by 4 in., and the corrugated board is $\frac{3}{16}$ in. thick.

The recommended shipping container was constructed of A and B fluted, corrugated paperboard, $\frac{5}{16}$ in. thick. Inside dimensions are $22\frac{3}{8}$ by $11\frac{1}{2}$ by 12 in., so that there is a small space between the walls and the fillet boxes to be filled with carbon dioxide gas. The container is so cut that the top and bottom side flaps fit snugly end to end, giving the maximum structural strength and best conditions for thorough sealing.

The fish fillets are quickly prechilled to from 32 to 40 deg. F. before packaging by dipping in brine maintained at 26 to 28 deg. F.

In one laboratory test of a package prepared according to specifications as used by the Atlantic Coast Fisheries, a sealed shipping unit containing 40 lbs. of fresh cod fillets was held for 39 hours, in a room in which the temperature was maintained constantly at 70 to 75 deg. F. Twenty-six pounds of dry ice were used in the container at the start. Temperatures were obtained on a recording resistance thermometer by means of thermocouples placed in various parts of the package, and the package itself (Continued on page 216)

Effects of heat sealing on water-vapor permeabilities of coated cellophanes

by William Rabak and G. L. Dehority*

Much work has been conducted on the water-vapor resistances of packaging materials that are heat-sealable, but virtually no studies have been reported on the effects of sealing methods on the efficiency of the heat-modified areas of these materials. Since the character of the sealing operation may bear directly on the overall efficiency of a packaging material, definite knowledge on this point, particularly for coated cellophanes, has been obtained.

Ordinary glue or paste sealing is the age-old method of closure which, of course, is unsatisfactory when water-vapor resistance is desirable. Glues or cementing materials that are resistant to moisture and water fulfill this requirement but do not always lend themselves readily to machine or other rapid closing operations. Quick-drying cements can be used satisfactorily in the sealing of water vapor-resistant cellophanes, but the most widely used method is the application of heat, which softens or melts the coating and, upon re-solidification, creates a firm bond between the two coated surfaces. This method is advantageous because it lends itself to either hand or machine sealing and does away with cumbersome and sometimes unsatisfactory application of adhesives.

Heat-sealable coatings

Many organic sheet materials of plastic nature can be softened or partially liquefied under controlled conditions of temperature and pressure that result only in physical changes, and upon cooling they resume their original characteristics. However, if excessively high temperatures are used, the plastic material may be changed chemically as well as physically to such a degree that when solidification takes place the plastic does not return to its original condition.

The heat-sealing qualities and the moisture and water resistances of cellophanes are dependent upon thin coatings of plasticized lacquers. Information on the behavior of these films is desirable now because of recently increased use of heat-sealable, moisture-resistant, non-metallic containers for dehydrated and frozen foods; it is especially desirable because the practice of heat sealing is generally done under poorly controlled conditions of heat, pressure and time of contact.

Water-vapor resistances of packaging materials

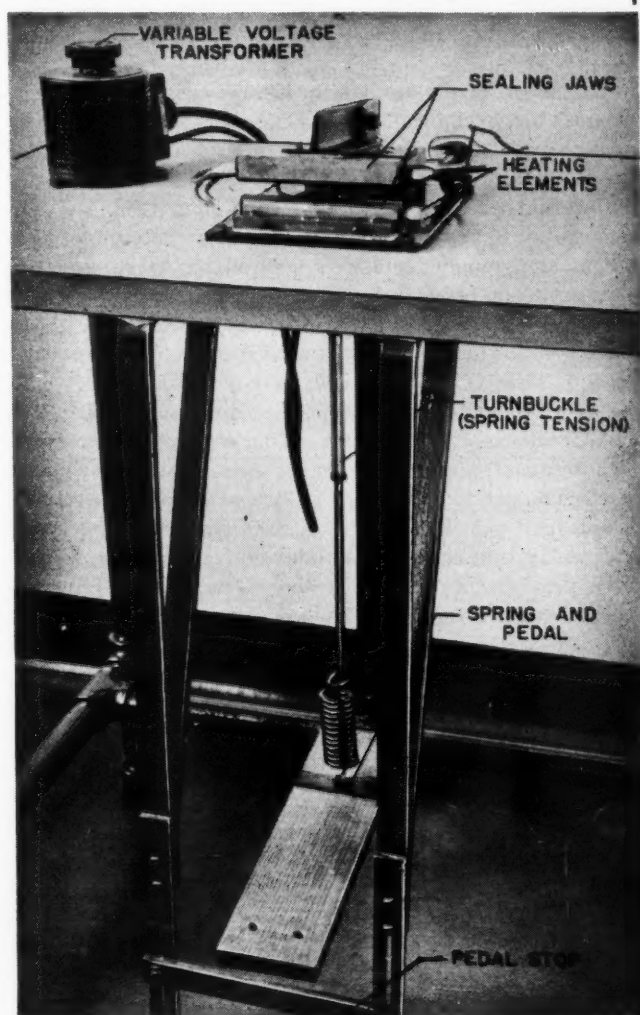
Pitman, Rabak and Yee¹ reported on the permeability and water-vapor resistances of packaging and lining materials and performed some preliminary work on the reduction in water-vapor resistances of coated materials as the result of heat sealing. They indicated that "close and correct control of temperature, jaw pressure and time in the sealing machine are

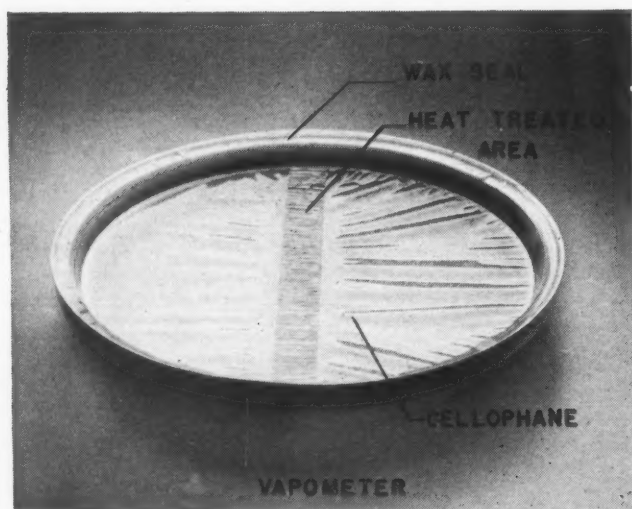
essential to the best heat seals." Leinbach² discussed the techniques and mechanics of heat sealing, stressing particularly the operation of commercial sealing mechanisms, heat-sealing agents, and the theories of heat-sealing methods, but offered no experimental data. Oswin³ has discussed the effects of heat-sealing procedures on cellophane lacquers, but did no work to determine suitable sealing temperatures.

Accordingly, tests were planned and carried out to ascertain the effects of low, intermediate and abnormally high sealing temperatures on the water-vapor permeability of cellophanes and also the effects of varying pressures applied during the sealing operation. Owing to the large number of

² F. S. Leinbach, "Heating Sealing I. Agents, Their Application and Evaluation," *MODERN PACKAGING*, pg. 85 (May 1943). F. S. Leinbach, "Heat Sealing II. Techniques and Mechanics," *Ibid.*, pg. 91 (June 1943).
³ C. R. Oswin, "The Permeability of Transparent Wrappings," *Jour. Soc. Chem. Ind.*, pg. 45-48 (April 1943).

1—Machine for applying heat and pressure to cellophane





2—Crimped, overlap-sealed cellophane in a Vapometer.

variables involved, it was thought desirable that a short-cut be employed in an effort to obtain pertinent information at a time when packaging techniques are undergoing rapid changes. Consequently the type and number of determinations were limited to the minimum necessary to indicate weaknesses associated with present heat-sealing techniques.

Special heat-sealing mechanism

To carry out the investigation it was necessary to build a heat-sealing mechanism in which at least three variables, temperature, pressure and time of contact, were under exact control.

The design of the mechanism has been classified by Leinbach² as the "reciprocal" type. The sealer is operated by the application of controlled pressure to electrically heated and thermostatically regulated sealing jaws, manually activated for pressure and control of time of contact (Fig. 1). The temperatures of the brass sealing jaws were determined with a contact pyrometer and were controllable to ± 10 deg. F. Two styles of brass sealing jaws were employed, one pair having a corrugated and the other a plain surface. Seals made with the former produced what is commonly known as a "crimp" seal. The sealing jaws were individually heated by two Westinghouse "core" type electrical heating elements having capacities of 90 watts. The pressures between the jaws were controllable to ± 5 lbs. per sq. in. of surface by means of a pedal operated through a calibrated spring. Two types of heat treatment were applied, namely, "imprint" and "overlap" seal, involving both the plain and corrugated sealer surfaces, the dimensions of which were $1/2$ in. by $5 1/4$ in., with a sealing area of 2.6 sq. in. The "imprint" treatment was used to permit measurement of the effects of temperatures and pressures on the lacquers on single thicknesses of cellophane. The "overlap" seal, being the type employed in bag making and package overwrapping, was included to ascertain the extent of "edge leakage" permitted by this commonly accepted method of sealing.

Sealing time, temperatures and pressures

Three sealing temperatures were employed: 285 deg., 385 deg. and 450 deg. F. These temperatures were used as a result of suggestions from the trade and after a series of preliminary qualitative tests to ascertain the strengths of the seals made at low, intermediate and high temperatures. A sealing temperature of 285 deg. F. was found to be slightly

too low to produce a firm bond, although at this temperature virtually no impairment of the lacquer coatings occurred. While a firm bond was produced at 385 deg. F., considerable disturbance of the lacquer occurred, indicating that the most suitable sealing temperature for these cellophanes is between 285 deg. and 385 deg. F. At 450 deg. F. the lacquers discolored (turned brown), indicating incipient decomposition. Two extremes of pressure between the sealing jaws were employed, namely, 10 and 50 lbs. per sq. in. The time of contact between the sealing jaws was one second in all cases.

The effect of the heat and pressure treatment on the coating of the cellophane was determined by measurement of water-vapor permeability. A disk of suitable diameter was cut from the cellophane sheet in such a manner that the heat-treated area formed a band across the center of the disk (Fig. 2). The permeability of this disk to water vapor was then determined as described in the following section.

Determination of water-vapor permeability

The water-vapor permeability determinations were carried out by a standardized procedure which consisted essentially of the method adopted by the Technical Association of the Pulp and Paper Industry,⁴ but with the use of a specially designed test dish similar in construction to the "General Foods Test Dish"⁵ and a testing tunnel having an air velocity of 500 ft. per minute with the air maintained at an average relative humidity of 87 per cent and an average temperature of 89 deg. F. The average vapor-pressure difference between the atmosphere maintained in the testing tunnel and the inside of the "vapometer" or test dish was 28.0 mm. of mercury. To insure accuracy in calculations of constants, the fluctuations in the temperatures and relative humidities of the circulated air were recorded by means of a standardized recording instrument.

The large type of vapometer was adopted. These vapometers exposed a total area of 21.6 sq. in., of which the heat-treated area comprised 2.6 sq. in. Therefore, the untreated exposed area represented 88 per cent of the entire surface, except for the controls. They were so designed that the inner shoulder permitted the use of a metal template to define the test area after the application of a wax seal. This type of seal prevents surface and edge leakage as required by both the General Foods method and by the official TAPPI method.

A special sealing compound was developed for this work. The "wax" mixture consisted of one part of resin and two parts of midcontinent paraffin.⁶ This combination adhered firmly to both the aluminum vapometer and to the lacquered cellophane surfaces, obviating the necessity of "anchoring" the sealing wax to the aluminum by means of shellac or other bonding material. Many experimental wax mixtures pulled away from the metal shoulder during test, because of improper physical characteristics, and thus destroyed the tightness of the seal.

Results and discussion

The data reported (Table I) represent an average of five determinations in each case, including the controls. The control determinations were repeated in each series to ascertain the possible variations in permeabilities of adjacent areas of the material. This repetition made possible an accurate comparison of the controls with the heat-sealed materials when subjected to identical conditions in the testing tunnel during

⁴ "Water Vapor Permeability of Paper and Paperboard," TAPPI Section, *Paper Trade Journal* p. 61, (Aug. 8, 1940.)

⁵ MODERN PACKAGING, p. 78 (November 1942).

⁶ Barnsdall Special Wax, 160/165 deg. F. M. P. Bareco Oil Co., Tulsa, Oklahoma.

each run. The calculated water-vapor permeability constant, designated by *K*, is defined as the grams of water-vapor passing through one square meter of surface per 24 hrs. per

TABLE I.—THE EFFECTS OF HEAT-SEALING METHODS ON CELLOPHANES

Type of seal	Temperature of sealing jaws Deg. F.	Pressure on jaws Lbs./sq. in.	Average moisture pick-up G./day/sq. in.	Average <i>K</i> value	Average deviation from <i>K</i>
LACQUER A, WATER AND MOISTURE RESISTANT, ANCHOR-COATED SPECIAL "ALL PURPOSE"					
Controls	...	..	4.0	0.14 ^a	0.01 ^a
Crimp imprint	285	10	2.2	0.08	0.01
" "	385	10	9.0	0.3	0.3
" "	450	10	30.	1.1	0.4
Controls	...	..	2.8	0.12 ^a	0.01 ^a
Crimp imprint	285	50	2.4	0.10	0.006
" "	385	50	16.	0.7	0.3
" "	450	50	72.	2.9	0.4
Controls	...	..	3.0	0.09 ^a	0.01 ^a
Plain imprint	285	10	2.2	0.08	0.005
" "	385	10	13.	0.4	0.1
" "	450	10	150.	5.2	0.4
Controls	...	..	2.1	0.08 ^a	0.01 ^a
Plain imprint	285	50	2.4	0.09	0.01
" "	385	50	23.	0.8	0.3
" "	450	50	230.	8.	1.7
Controls	...	..	2.2	0.08 ^a	0.02 ^a
Crimp overlap	285	10	8.0	0.3	0.1
" "	385	10	74.	2.6	0.1
" "	450	10	100.	3.6	0.4
Controls	...	..	1.8	0.07 ^a	0.01 ^a
Crimp overlap	285	50	13.	0.5	0.1
" "	385	50	57.	2.0	0.15
" "	450	50	52.	1.9	0.2
Controls	...	..	2.0	0.07 ^a	0.02 ^a
Plain overlap	285	10	7.5	0.2	0.1
" "	385	10	12.	0.4	0.16
" "	450	10	180.	6.0	2.0
Controls	...	..	3.1	0.11 ^a	0.02 ^a
Plain overlap	285	50	2.3	0.08	0.02
" "	385	50	4.2	0.15	0.04
" "	450	50	166.	6.0	0.6

LACQUER B, MOISTURE RESISTANT, NOT ANCHOR-COATED

Controls	...	..	2.7	0.1 ^a	0.02 ^a
Crimp imprint	285	10	2.4	0.09	0.01
" "	385	10	11.5	0.4	0.09
" "	450	10	170.	8.	4.
Controls	...	..	1.8	0.07 ^a	0.007 ^a
Crimp imprint	285	50	7.0	0.26	0.006
" "	385	50	7.7	0.3	0.1
" "	450	50	22.	0.7	0.1

LACQUER C, WATER AND MOISTURE RESISTANT, ANCHOR-COATED

Controls	...	..	4.9	0.17 ^b	0.01 ^b
Crimp imprint	285	10	3.4	0.14	0.03
" "	385	10	47.	1.2	0.5
" "	450	10	90.	3.2	0.2
Controls	...	..	2.8	0.10 ^b	0.005 ^b
Crimp imprint	285	50	6.8	0.25	0.1
" "	385	50	5.6	0.26	0.2
" "	450	50	140.	5.2	0.4

^a Average *K* values of controls (all determinations) = 0.09. Average deviation from *K* (all determinations) = 0.02.
^b Average *K* values of controls (all determinations) = 0.14. Average deviation from *K* (all determinations) = 0.03.

mm. of mercury difference in water-vapor pressure between the outside and the inside of the vapometer.

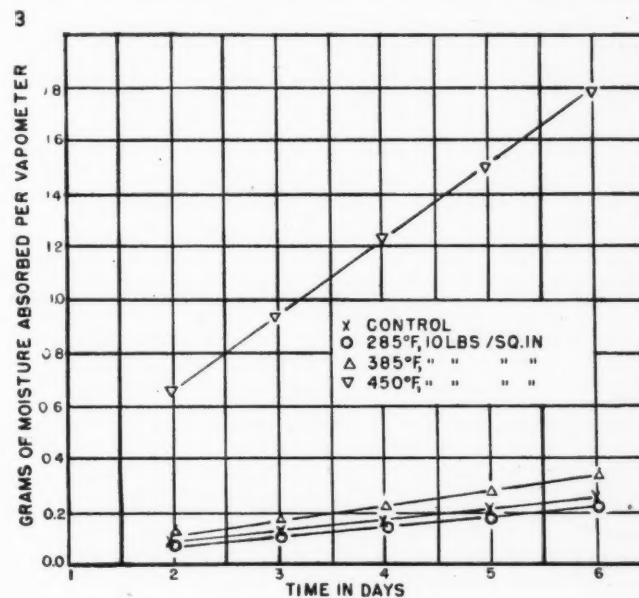
The results obtained indicate that in some cases wide variations of water-vapor permeability occurred in individual determinations. Control determinations that showed an abnormally high deviation from the mean were not included in final calculations. Since the method of sealing the test disks to the vapometers insured against leakage, it is assumed that the wide variation of some of the individual control determinations were due to variations in the thickness of the surface lacquers or to other imperfections such as microscopic perforations of the sheet. Oswin³ reported that cellophane surface lacquers are sometimes only 0.00005 in. thick, which could easily indicate that some of the inequalities of water-vapor resistances found in different areas of the same sheet could be due to gross lack of uniformity of coating thickness or possibly to the complete absence of coatings in some areas. Wide variation in the duplicate determinations of the heat-modified areas is not surprising, since the application of heat and pressure causes marked changes in the continuity and character of the coatings.

The two general types of 300-gage lacquered cellophane sheets used in the tests were those designated as anchor-coated and non-anchor-coated. The former is resistant to both water and moisture; the latter only to moisture (Table I). The upper section of Table I presents the constants obtained on special "all purpose" water- and moisture-resistant cellophane (lacquer A). The work on this particular sheet was quite complete to enable a comparison of the effects on water-vapor permeabilities due to different heat-sealing procedures. In the lower sections data are included to permit a comparison of the behavior of ordinary moisture-resistant (non-anchor-coated) cellophane (lacquer B) with an ordinary anchor-coated type (lacquer C).

Fig. 3 shows the destructive effects of an abnormally high sealing temperature (450 deg. F.) on the coating of cellophane A as compared to low and "intermediate" sealing temperatures.

While the number of determinations conducted was not sufficient to warrant the establishment of definite standards, the work clearly indicates the trends (Continued on page 220)

3—Effects of temperatures on the moisture permeability of the heat-treated areas of tested cellophanes.



Corrosion of tin-nickel alloy coatings on steel

by H. R. Copson* and W. A. Wesley*

The galvanic behavior of steel coupled with tinplate, tin-nickel alloy coatings and nickel was observed during exposure to typical corrosive canned foodstuffs under anaerobic conditions. The results indicated that the alloy coatings were anodic to bare steel in four of five foods tested and not appreciably cathodic in the fifth. This, together with observations of the degree of corrosion which occurred, led to the conclusion that nickel-tin coatings are potential substitutes for heavier tin coatings so that a substantial saving in tin may be possible. The tin content of the alloy coating is useful in overcoming the noble potential of pure nickel and to take advantage of the marked inhibiting effect of tin compounds upon the corrosion of steel laid bare at pores, bends and defects in the coatings.

Introduction

The accepted procedure in the can industry for evaluating the suitability of a coating for steel is the expensive and time-consuming one of making multiple experimental food pack tests involving production and packing of cans in commercial canning machinery and subsequent storage for as long as 600 days. When interest in the conservation of tin began to grow in 1940, evidence was being accumulated that thin alloy coatings of nickel and tin on steel are as protective in the salt spray test as much thicker coatings of tin or nickel alone.¹ It was desired to determine whether or not a similar advantage of alloy coatings should be expected in resistance to corrosion by canned foodstuffs, and, if so, whether a recommendation should be made that standard packing tests be undertaken.

What was needed was a laboratory test from which indications of the relative behavior of several kinds of coatings on steel could be obtained in a short time, yet which would involve corrosive conditions convincingly similar to those inside a can of food. It was felt that the first objective could

be achieved by a study of galvanic effects. Much of the literature on corrosion in tin cans is rendered unreliable by failure to run tests under anaerobic conditions and by the use of simple organic acids, such as citric acid, to represent foodstuffs. To avoid these pitfalls the corrosion media in the present tests consisted of several types of canned foods, and air was carefully excluded. The electrode potential of individual test pieces and of galvanic couples was recorded at intervals without disturbing the contents of the sealed test jars, a procedure similar to that of Kohman and Sanborn.²

Interpretation of the results was strongly influenced by the work of T. P. Hoar.³ Two basic assumptions were made: First, it is advantageous if coatings for use without lacquering are anodic to steel, or at least not appreciably cathodic, when tested under conditions simulating those maintained within a can. Second, coatings which are not broken down in 200 days in corrosive foodstuffs at 100 deg. F. (38 deg. C.) are resistant enough to corrosion to be commercially interesting.⁴

Materials

Two thicknesses of tin-nickel alloy coatings were used. The plated steel was supplied by the Standard Steel Spring Co., Coraopolis, Pa. The coatings were approximately 0.00002 and 0.00006 in. (0.5 and 1.5 μ) thick. They had been made by plating steel with equal thicknesses of first nickel and then tin, and then heating. The finishing treatment was at 575 deg. F. (300 deg. C.) for 6 to 8 minutes. The bare steel, solid nickel and tinplate were taken from stocks at this laboratory. Table I gives the analyses and thicknesses of the materials. All the steels were of tinplate grade. The higher phosphorus in the tinplate sample may have rendered this material comparatively less resistant to corrosion.⁴

The nature of alloy coatings produced by diffusion was dis-

* Research Chemist and Assistant Director, respectively, Research Laboratory, The International Nickel Co., Inc., Bayonne, N. J. From a paper presented at the 84th General Meeting of the Electrochemical Society and reprinted with the permission of the authors and the Electrochemical Society.

¹ Unpublished data, Standard Steel Spring Co., Coraopolis, Pa.

² F. F. Kohman and N. H. Sanborn, "Tin Plate and the Electrochemical Series," *Ind. Eng. Chem.*, 20, 77 (1928).

³ T. P. Hoar, "The Electrochemical Behavior of the Tin-Iron Couple in Dilute Acid Media," *Trans. Faraday Soc.*, 30, 472 (1934).

⁴ R. R. Hartwell, "Corrosion Resistance of Tin Plate," *Am. Soc. for Metals Symposium on "Surface Treatment of Metals,"* p. 69 (Oct. 1940).

TABLE I—MATERIALS

Material	Chemical analysis										Over-all thickness, inch	Calculated thickness of, as-deposited	
	C %	S %	P %	Si %	Mn %	Cu %	Ni %	Cr %	Sn %	Fe %		Nickel layer, inch	Tin layer, inch
Alloy													
Coated steel	0.10	0.029	0.009	< 0.01	0.44	0.02	0.53	< 0.01	.037	Bal.	0.011	0.000026	0.000022
Alloy													
Coated steel	0.11	0.032	0.008	0.01	0.44	0.017	0.23	0.020	0.15	Bal.	0.011	0.000011	0.000009
Tin plate	0.11	0.028	0.057	0.01	0.43	0.040	< 0.05	0.009	0.69	Bal.	0.020	.....	0.000074
Steel	0.09	0.034	0.010	0.01	0.34	0.036	< 0.05	0.014	...	Bal.	0.010	.....	.....
Nickel	0.13	0.005	...	0.04	0.19	0.06	99.41*	...	...	0.14	0.031	.....	.....

* Includes a fractional percentage of cobalt.

cussed by Lustman and Mehl.⁵ To obtain a better conception of the present coatings they were examined in cross section under the microscope, and also they were stripped layer-wise in cold concentrated hydrochloric and nitric acids and the solutions analyzed. The results for the thicker coating are shown in Figs. 1 and 2, respectively. The results with the thinner coating were similar except that the layers were proportionately thinner. The photomicrograph in Fig. 1 shows the presence of at least two layers in the coating. The one next to the steel is nickel-rich and the outer layer is tin-rich. The results of the stripping experiments in Fig. 2 show that in the middle of the coating there is a diffusion zone of considerable thickness and probably with a composition gradient. A good portion of the diffusion zone corresponds closely to the compound Ni₃Sn₄. The outer fifth of the coating was still pure tin, and quite likely there was a layer of pure nickel next to the steel.

Values for the thickness of the coating as obtained from Figs. 1 and 2 and calculated from the chemical analysis and steel base thickness in Table I were in good agreement with the nominal plated thickness. The size of the coated specimens in the corrosion tests was 1.63 dm.² The weight of coating in this area is given in Table II.

TABLE II

Material	Weight of coating on 1.63 dm. ² , gram
Steel coated with 0.00006 in. (1.5 μ) of tin-nickel alloy	0.20
Steel coated with 0.00002 in. (0.5 μ) of tin-nickel alloy	0.07
Tinplate with 0.000074 in. (1.9 μ) of tin	0.22

Foods

Tests were run in the five foodstuffs in Table III. These

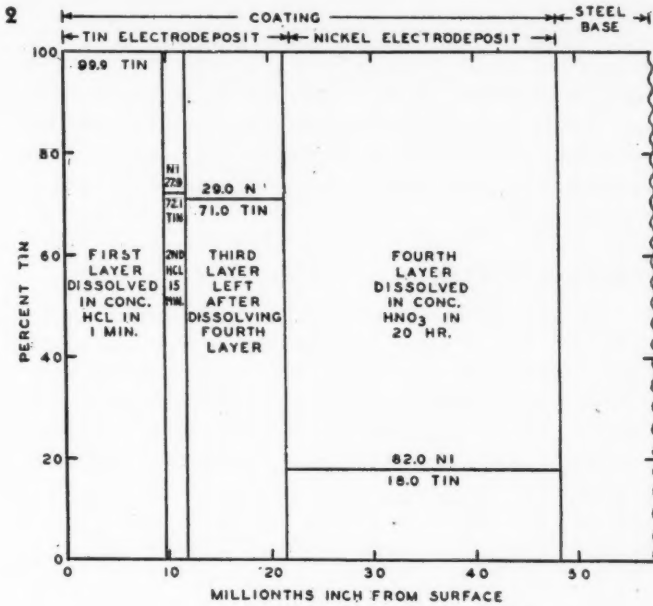
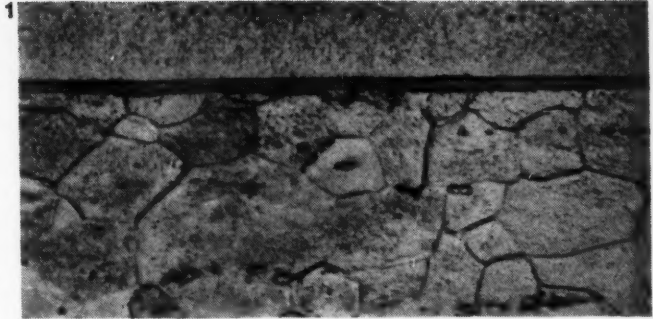
⁵ B. Lustman and R. F. Mehl, "Rate of Growth of Intermediate Alloy Layers in Structurally Analogous Systems," *Trans. Am. Inst. Mining Met. Engrs.*, 147, 369 (1942).

TABLE III—SCHEDULE OF TESTS

Temperature, 100 deg. F. Volume, 950 cc. Aeration, air excluded. Area steel specimens, 0.0163 dm.² Area other specimens, 1.63 dm.²

Cell	Food	pH at start*	Time, days	Materials	
				A	B
1	Dried prunes in syrup	3.8	256	Alloy-coated steel, 0.00006 in. (1.5 μ)	Steel
2			256	Alloy-coated steel, 0.00002 in. (0.5 μ)	Steel
3			256	Tinplate	Steel
4			256	Nickel	Steel
5	Sauerkraut	3.6	249	Alloy-coated steel, 0.00006 in.	Steel
6			249	Alloy-coated steel, 0.00002 in.	Steel
7			249	Tinplate	Steel
8			249	Nickel	Steel
9	Tomatoes	4.2	235	Alloy-coated steel, 0.00006 in.	Steel
10			235	Alloy-coated steel, 0.00002 in.	Steel
11			235	Tinplate	Steel
12			235	Nickel	Steel
13	Spinach	5.4	230	Alloy-coated steel, 0.00006 in.	Steel
14			230	Alloy-coated steel, 0.00002 in.	Steel
15			230	Tinplate	Steel
16			230	Nickel	Steel
17	Peas	3.6	243	Alloy-coated steel, 0.00006 in.	Steel
18			243	Alloy-coated steel, 0.00002 in.	Steel
19			243	Tinplate	Steel
20			127	Nickel	Steel

* Glass electrode.



1—Cross section through 0.00006 in. (1.5μ) tin-nickel alloy coating. Steel at bottom and mounting medium at top. × 1000. 2—The composition of 0.00006 in. tin-nickel coating after heat treatment.

were selected on the basis of availability and as being representative of four types:⁶ Dried prunes in syrup and sauerkraut are classed as strongly corrosive food products, tomatoes as mildly corrosive, peas discolor tinplate, and spinach is noted for its detinning action.

The tomatoes, peas, and spinach were purchased in glass containers from the Snider Packing Corp. The sauerkraut was obtained from a local market where it had been stored in a wooden barrel. The dried prunes in syrup were prepared by soaking 300 dried prunes in 3,240 cc. of water for 20 hrs., adding 666 g. of cane sugar and cooking. It is felt that the foods were free of metallic contamination which might affect the results.

The pH of the foods at the start of the tests is given in Table III. It was subsequently learned that the peas had too low a pH to be typical.⁶ Presumably they were "flat sour" due to the activity of heat-resistant bacteria. For this reason the results in peas are not typical of those that would be expected in normal peas and should be given less weight than the others.

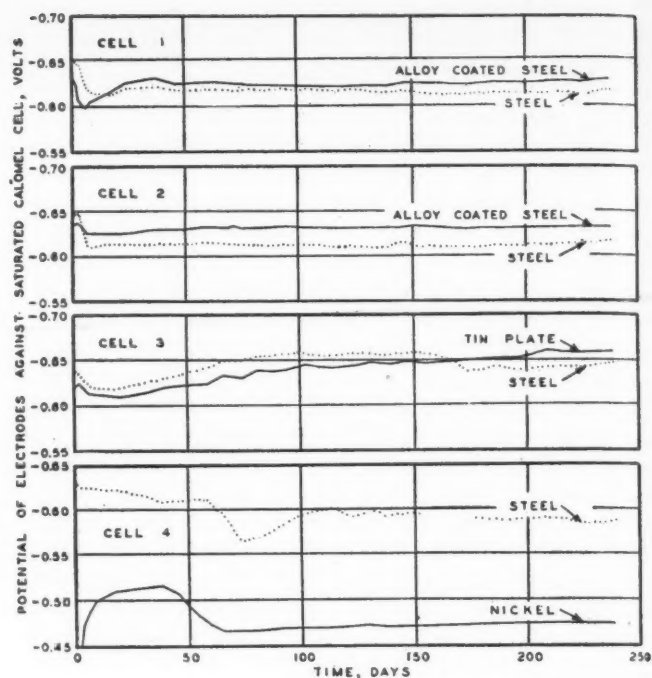
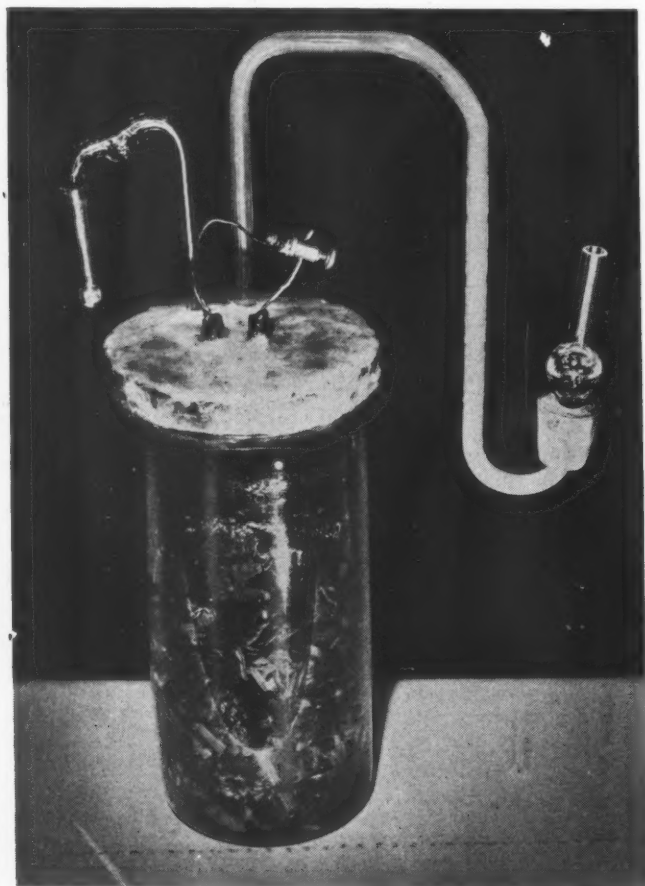
Schedule of tests

Four galvanic couples were run in each of the five foodstuffs as indicated in Table III. The area of the steel was made $1/100$ th that of the other member of the couple. This ratio was as large as conveniently possible (the steel specimens being 1.27 by 0.635 cm. and the others 12.7 by 6.35 cm.) but was not nearly so large as that existing in a tin can.⁷ The tests

⁶ Private communications from H. S. Van Vleet and R. R. Hartwell, American Can Co., Maywood, Ill.

⁷ W. E. Hoare, "Calculation of the Area of Basis Metal Exposed at Discontinuities in the Tin Coating of Tinplate," Publications Intern. Tin Research Development Council, No. 86 (1938).

Experimental galvanic corrosion test set-up.



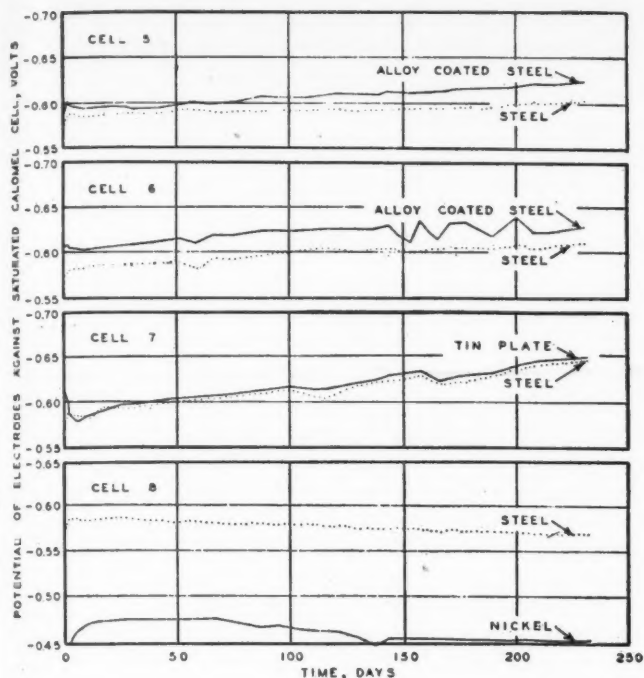
were continued for total times of 230 to 256 days, except for cell no. 20 which was stopped after 127 days.

Apparatus

One of the experimental set-ups is pictured in Fig. 3. A separate 1,000-cc., tall form, pyrex beaker fitted with a rubber stopper was used for each test. Four specimens were placed in each beaker, two of steel and two of the other member of the couple (Table III). Copper wires were soldered to one specimen of each material, brought out through the rubber stopper, and shorted externally. The wires were attached to small tabs which were left on the otherwise rectangular specimens. Each test involved both coupled specimens and uncoupled normally corroding specimens of the same materials. The copper and solder inside the jar were protected by means of lacquer, glass tubing, and high melting wax. The specimens were prevented from touching each other by glass holders. The cut edges of the alloy-coated specimens were protected by means of high melting wax.

Two glass tubes passed through each rubber stopper. The white colored tube in Fig. 3 was filled with a gel of agar agar and salt solution (10 g./L. of agar agar and 10 g./L. of potassium chloride), and served as a salt bridge for calomel cell measurements. When not in use the gel was prevented from drying by means of the water bulb. Constrictions in the tube prevented the gel from flowing. The other tube served to maintain atmospheric pressure inside the jar. The end of this tube was drawn down to a capillary tip and dipped into mercury. This allowed gas to escape but prevented air from entering.

In starting a test the specimens were put in place. Then the food was brought to boiling. The sterile solid constituents were packed around the specimens, and then the boiling juices were added to overflowing. The rubber stoppers were inserted tightly and sealed with paraffin. The beaker was placed in a water bath thermostatically controlled at 100 deg. F. (38 deg. C.). As the hot foods cooled to this temperature some additional juices were allowed to suck into the beakers through the open glass tube. After equilibrium was reached, this tube was sealed with mercury as described above.



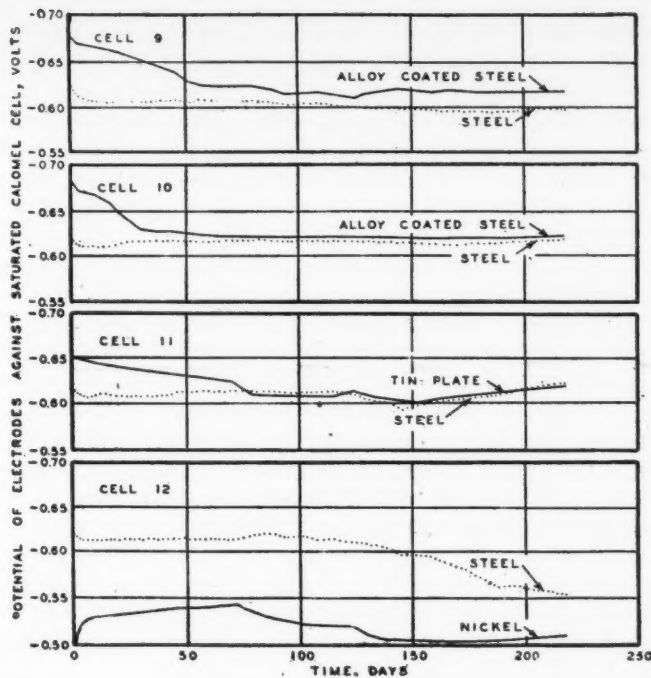
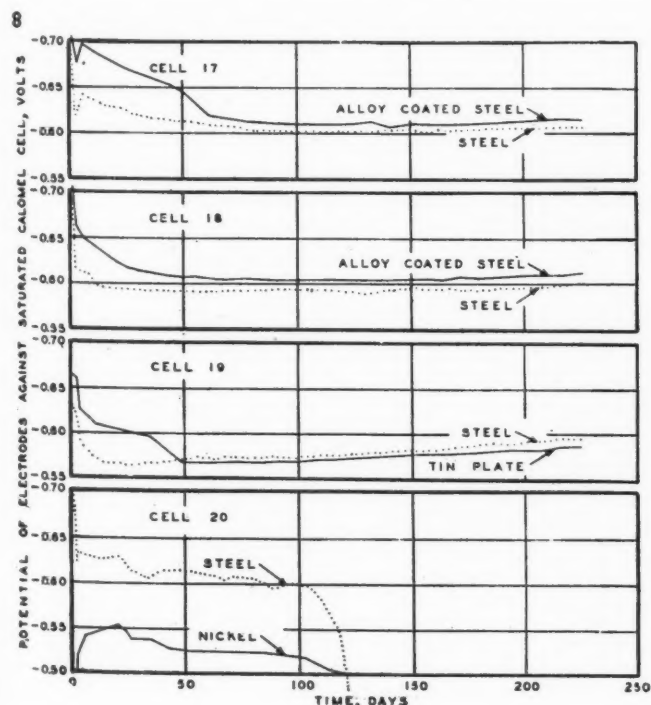
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Measurements

Potential, current, weight loss, and pit depth measurements were made. About once a week (more frequently at the start) the galvanic circuits were opened for one hour, and measurements were made of the open circuit potentials and of the potentials of the electrodes against a saturated calomel electrode. At about 220 days one set of current measurements was obtained by temporarily inserting 100 ohm resistances between the electrodes and measuring the potential drop across this. The weight loss and pit depth measurements were obtained after the tests were stopped.

Open circuit potentials

The potentials of the electrodes are plotted against time in Figs. 4, 5, 6, 7, and 8. The more negative the potential, the



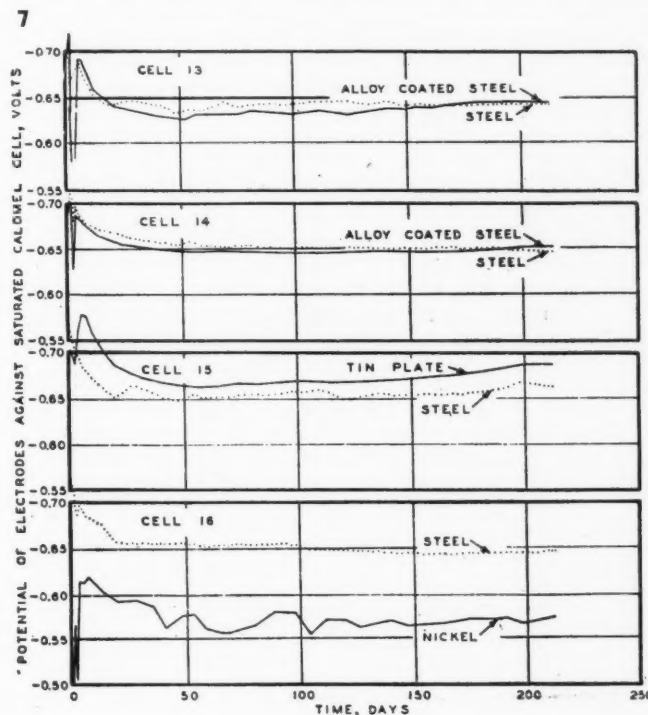
6

less noble the material. The potentials of the steel electrodes are shown by dotted lines and of the other electrodes by solid lines. For each cell the difference between the electrode potentials gives the open circuit e.m.f. of the couple.

At first the potentials bobbed about a bit in some cases, but they soon settled down to fairly constant values. After the first few days they seldom varied more than a few hundredths of a volt. In general the potentials were as anodic as any reported in can corrosion literature,⁸ which would indicate that anaerobic conditions were being maintained.

The potentials of the steel, tinplate, and tin-nickel alloy-coated steels were close together ($-0.63 \text{ v.} \pm$ a maximum of 0.05 v.). Nickel potentials were consistently about 0.1 volt more noble than the others. Accordingly, the open circuit

⁸ F. F. Kohman and N. H. Sanborn, "Acidity and Corrosion in Canned Fruit," *Ind. Eng. Chem.*, 22, 615 (1930).



potentials for the couples involving nickel were appreciable (0.08 v. or more), but all the other open circuit potentials were low (0.03 v. or less). It follows that the potentials gave no sure indication of the stripping of the coatings or of the initiation of any pitting. The potentials did show the direction of current flow, that is, which member of the couple was acting as anode and corroding. Except in spinach, the direction of current flow was consistently favorable to the tin-nickel alloy coatings, that is, the latter tended to protect the bare steel galvanically.

It is assumed that the measured potentials represented the potentials of the coatings and not of the underlying steel exposed through breaks in the coating. This was substantiated by some open circuit potential measurements in tomatoes between the steel of Table I and the alloy-coated steels both with the coating on and with the coating completely stripped, leaving the steel base bare. The experimental conditions were similar to those already described. With the coatings in place, the initial potential differences were 0.06 v. with the coatings anodic to the steel (just as in Fig. 6). With the coatings removed, the values were 0.006 v. with same sign. This difference is conclusive. In Figs. 4, 5, 6, and 8 the alloy-coated steels were usually anodic by more than 0.006 v.

Weight losses and pit depths

Individual weight losses and pit depths are given in Table IV, and average weight losses in Table V. By comparing Table V with Table II it is readily apparent that, in general, the coating was still largely intact in the case of the 0.00006-in. (1.5 μ) thick tin-nickel alloy, but seriously impaired in the case of the 0.00002-in. (0.5 μ) tin-nickel alloy and tinplate. The 0.00006-in. alloy coating consistently had lower weight loss than the 0.00002-in. alloy coating, which in turn was con-

TABLE V—AVERAGE WEIGHT LOSSES IN FIVE FOODS
Grams per 1.63 dm.²

Material	Uncoupled	Coupled
Nickel	0.085	0.017
Steel coated with 0.00006-in. tin-nickel alloy	0.098	0.098
Steel coated with 0.00002-in. tin-nickel alloy	0.44	0.38
Tinplate with 0.000074 in. of tin	1.10	0.98
Bare steel (calculated for equal area)	3.09	....

sistently better than tinplate. The weight losses on tinplate seem high, particularly in prunes and sauerkraut. This may be due either to the higher phosphorous content or to the small area of steel exposed at the edges. The 0.00006-in. thick alloy coating had a normal corrosion rate about as low as solid nickel, but it did not accelerate the galvanic corrosion of steel the way nickel did. Steel had the highest normal corrosion rates of all the materials.

The corrosion products accumulating in the foods influenced the corrosion rates. In prunes, sauerkraut and tomatoes the normal corrosion rate of steel was suppressed by the co-presence of tin. This effect is well known.⁹ In a can holding about the same quantity of food as used in these tests (a No. 3 can, capacity 990 cc.) the inside area is about 5.5 dm.² Hence, in an actual can, more tin corrosion products would be expected to get into the food and inhibition of corrosion might be greater.

In prunes most of the steel specimens pitted. Steel corroded uniformly in all the other foods, except that in the cells containing no tin the steel specimens tended to corrode

⁹ R. J. McKay and R. Worthington, "Corrosion Resistance of Metals and Alloys," p. 185, Reinhold Publishing Co., N. Y. (1936).

TABLE IV—WEIGHT LOSSES AND PIT DEPTHS

Cell	Material A of Table III						Material B of Table III					
	Coupled			Uncoupled			Coupled			Uncoupled		
	Weight loss		Pitting ave. of 4 deepest, in.	Weight loss		Pitting ave. of 4 deepest, in.	Weight loss		Pitting ave. of 4 deepest, in.	Weight loss		Pitting ave. of 4 deepest, in.
	Gram	Mg. per dm. ² per day		Gram	Mg. per dm. ² per day		Gram	Mg. per dm. ² per day		Gram	Mg. per dm. ² per day	
1	0.0614	0.15	0.003	0.0421	0.10	0.003	0.0654	16	Perforated	0.0793	19	Perforated
2	0.1790	0.43	0.002	0.3813 ^a	0.92 ^a	0.002	0.0368	9	Perf. at tab	0.0556	13	Perf.
3	1.0589	2.5	0.002	1.9744	4.7	0.004	0.0781	19	Perforated	0.0309	7.4	0.004
4	0.0440	0.11	...	0.0828	0.20	...	High ^c	< 49 ^c	Perf. at tab	0.1128	27	Perf.
5	0.2418	0.59	0.004	0.2872	0.71	0.004	0.0291	7.2	.....	0.0475	12	.....
6	1.2160	3.0	0.002	1.1860	2.9	0.002	0.0148	3.6	.....	0.0371	9.1	.....
7	1.6064	4.0	0.001	1.5697	3.9	0.001	0.0234	5.8	.....	0.0239	5.9	.....
8	0.0037	0.01	...	0.1820	0.45	...	0.1611	40	Perf. at tab	0.0621	15	Perf. at tab
9	0.0584	0.15	...	0.0373	0.10	...	0.0077	2.0	.....	0.0103	2.7	.....
10	0.1187	0.31	< 0.001	0.1396	0.36	< 0.001	0.0103	2.7	.....	0.0107	2.8	.....
11	0.5514	1.4	0.004 ^d	0.5727	1.5	0.004 ^d	0.0138	3.6	.....	0.0095	2.5	.....
12	0.0311	0.08	...	0.0973	0.25	...	0.1887	49	Perf. at tab	0.0761	20	Perf. at tab
13	0.0595	0.16	...	0.0418	0.11	...	0.0164	4.4	.....	0.0066	1.7	.....
14	0.1516	0.40	< 0.001	0.1588	0.42	< 0.001	0.0105	2.8	.....	0.0059	1.6	.....
15	0.1406	0.37	...	0.1760	0.47	...	0.0052	1.4	.....	0.0043	1.1	.....
16	0.0019	0.01	...	0.0361	0.10	...	0.0503	13	.....	0.0046	1.2	.....
17	0.0683 ^b	0.17 ^b	0.001	0.0844 ^b	0.21 ^b	< 0.001	0.0483	12	.....	0.0070	1.8	.....
18	0.2512	0.63	0.003	0.3573	0.90	0.002	0.0110	2.8	.....	0.0120	3.1	.....
19	1.5640	3.9	...	1.2172	3.1	...	0.0168	4.3	.....	0.0146	3.7	.....
20	0.0042	0.02	...	0.0255	0.12	...	0.1759 ^c	86 ^c	Perf.	0.0071	3.5	Perf. at tab

^a Wt. loss high due to peeling of coating in one spot. ^b Wt. loss high due to defect in coating. ^c Wt. loss high; part of specimen may not have been recovered. ^d All pits near upper edge in headspace.

TABLE VI—GALVANIC CORROSION DATA

Cell	Anode by weight loss	Anode by potential curves	Other electrode	Open circuit potential volts	Galvanic current at about 220 days, milliamperes	Galvanic corrosion of anode, mg. per dm. ² per day	
						From weight losses	From current at 220 days
1	Alloy	Alloy	Steel	0.01	0.0023	0.05	0.05
2	Alloy	Alloy	Steel	0.02	0.0045	?	0.09
3	Steel	Steel ^a	Tinplate	Small ^a	-0.0005 ^b	11.4	....
4	Steel	Steel ^a	Nickel	0.11	0.0016	< 22	2.5
5	Alloy?	Alloy	Steel	0.02	0.0065	- 0.1	0.1
6	Alloy	Alloy	Steel	0.02	0.0063	0.1	0.1
7	Tinplate	Tinplate	Steel	0.004	0.0005	0.1	0.02
8	Steel	Steel	Nickel	0.12	0.0174	24.6	26.7
9	Alloy	Alloy	Steel	0.02	0.0017	0.05	0.03
10	Alloy?	Alloy	Steel	0.004	0.0005	- 0.05	0.01
11	Steel	? ^a	Tinplate	Small ^a	0.0005 ^a	1.1	....
12	Steel	Steel	Nickel	0.08	0.0034 ^c	29.6	5.2 ^c
13	Steel?	Steel ^a	Alloy	Small ^a	-0.0004 ^e	2.7	....
14	Steel?	Steel ^a	Alloy	Small ^a	-0.0010 ^e	1.2	....
15	? ^d	Tinplate	Steel	0.02	0.0012	? ^d	0.04
16	Steel	Steel	Nickel	0.08	0.0060	12.3	9.2
17	? ^d	Alloy	Steel	0.01	0.0007	? ^d	0.01
18	Alloy?	Alloy	Steel	0.01	0.0016	- 0.3	0.03
19	Steel?	Steel? ^a	Tinplate	Small ^a	0.0018	0.6	2.8 ^a
20	Steel?	Steel	Nickel	0.08		< 82	....

^a Some reversals in potential. ^b Minus sign indicates that potential and current had reversed at 220 days. ^c By 220 days the open circuit potential and probably the current were dropping. ^d Weight losses in cells nos. 15 and 17 were in disagreement with potential curves.

through at the tabs. The 0.00002-in. alloy-coated steel was profusely pitted in all five foods, but the pit depths were shallow (0.003 in. or 0.076 mm. maximum). Corrosion at the pits undoubtedly accounted for a large percentage of the weight loss on this material. The 0.00006-in. alloy-coated steel was appreciably pitted only in prunes and sauerkraut, but the pits were somewhat deeper than in the case of the thinner alloy coating. Tinplate was pitted in prunes, sauerkraut and tomatoes. Much of the tin coating was removed in these foods and also in peas. Except in cell No. 3 there was no real difference in the pit depths on coupled and uncoupled specimens. On none of the coated materials were the pits deep enough to produce perforations.

Galvanic corrosion—Table VI

The anodes of the couples were indicated by the potential curves, by the weight losses and by the current measurements. However, the current measurements were made only once at about 220 days, and hence must be interpreted in connection with the condition of the cells at that time.

The weight losses are subject to two criticisms. First, the steel specimens were so tiny that the weight losses were small, and the differences in weight loss between coupled and uncoupled specimens even smaller. Thus in cells nos. 7, 10, 15, and 18 the differences were only 0.5, 0.4, 0.9, and 1.0 mg., respectively. Second, the pitting of the coated specimens makes it doubtful that all the difference in weight loss should rightfully be attributed to galvanic effects. Thus the presence of defects in the coating could lead to more rapid pitting and greater weight loss, which undoubtedly happened in cells nos. 2 and 17.

The potential readings were repeated so frequently that they must be considered the most reliable indicators of direction of galvanic effects. In most cases they definitely established the anodic member of the couple. However, in cells

nos. 3, 11, 13, 14, and 19, reversals in potential took place later than the first few days. Nevertheless, only in cell no. 11 and possibly no. 19 was there much doubt as to the predominant direction of current flow. Late reversals in potential should not be considered too significant owing to the exposure of the steel base on many of the coated specimens.

Careful weighting of these various factors leads to the conclusions regarding the direction of galvanic effects shown in Table VI. For the most part the different measurements were in excellent agreement. Some of the checks in the galvanic corrosion as calculated from the weight losses¹⁰ and as calculated from the currents were amazingly good.

The principal conclusion is that with 100 to 1 area ratios both tin-nickel alloy-coated steels were anodic to steel except in spinach, and not appreciably cathodic in spinach. The magnitude of the galvanic currents tended to parallel the magnitude of the open-circuit potentials. In general, both the open-circuit potential and the current were low, so that the steels were not completely protected. This tends to be confirmed by the shallow pitting of some of the alloy-coated specimens. The pitting might also be explained by the laminated character of the coating, that is, the pits may have been confined to regions where the outer tin-rich, less-noble layers were removed, so that the nickel-rich, more-noble undercoat behaved like a thin, porous, nickel electrodeposit. This possibility would be avoided if the tin and nickel were plated simultaneously as an alloy, as has been done experimentally.

Acknowledgment

The advice of R. J. McKay and the experimental assistance of R. H. Rogge are gratefully acknowledged.

¹⁰ W. A. Wesley, "Anode and Cathode Weight Losses in Galvanic Corrosion," *Trans. Electrochem. Soc.*, 73, 539 (1938).

QUESTIONS and

Answers

This consultation service on packaging subjects is at your command. Simply address your questions to Technical Editor, Modern Packaging, 122 East 42nd St., New York 17, N. Y. Your name or other identification will not appear with any published answer.

Is waterproof adhesive necessary?

QUESTION: *Our company packages, in a lined folding carton, a dry powdered chemical which absorbs moisture and then hardens into an unusable mass. Our laboratory package tests are made at 70 deg. F. and 100 per cent relative humidity. The final data indicated that our present package gives good water-vapor protection to the product and that waterproof adhesive should be used to close the carton flaps. Our production department finds it difficult to use these adhesives and questions the necessity of a waterproof adhesive for a package going through the usual retail channels. Do you feel that such adhesives are necessary?*

ANSWER: The conditions under which your laboratory tests packages, 70 deg. F. and 100 per cent relative humidity, are not good levels for packages going into the usual retail channels. A temperature of 70 deg. F. is too low to be held without cooling equipment and this adds to the cost and complexity of the testing cabinet. Furthermore, a relative humidity of 100 per cent is too severe in that it means the packages will be exposed to some condensation and thus softened by liquid water. Also cellulose (the carton stock) picks up a large amount of moisture and is weakened by humidities approaching 100 per cent. These effects also soften and destroy the bond of non-waterproof adhesives. However, your test packages can be exposed to other conditions which will give you accurate and reproducible results, easier control and no softening of the adhesive. Such test conditions would be 100 deg. F. and 90 per cent relative humidity. This temperature is easily maintained and controlled, and gives a high vapor pressure.

For example, the following table

Conditions	Vapor Pressure
100 deg. F. 90 per cent R. H.	44 m. m.
70 deg. F. 100 per cent R. H.	19 m. m.
Increase	25 m. m.

shows the water vapor pressure of both conditions and the increased vapor pressure of recommended atmosphere. This means the sample packages will be given a more accelerated test and yet a non-waterproof glue on the carton flaps will not be affected.

By all means discontinue the use of the waterproof adhesive because it is not necessary for this use.

Transmission of organic vapors

QUESTION: *We are packaging a food product which contains lemon oil as a flavoring ingredient. Our present package is a carton with a heat-sealed cellophane bag inside. We have received many complaints of our product having a "paint-like" smell. Can you suggest a possible cause and its correction?*

ANSWER: The lemon oil is being slowly oxidized by the oxygen in the air and the breakdown products have a turpentine-like odor. This odor is being held in your package by the cellophane which is an effective barrier against the transmission of organic vapors. The problem is to find a bag or liner material which does not hold these vapors. Glassine and parchment also hold such vapors while other papers either plain or waxed will allow such vapors to pass out of the package and be dissipated.

You should collect a wide variety of possible bag and liner materials and subject them to a quick test. Such a test would consist of making up sample packages of your product and placing them in a cabinet held at 100 deg. F. for two weeks. Then open each package and compare the odors. It should be possible to find several materials which will not have a turpentine-like odor after such an accelerated storage. You must appreciate the fact that any material which will allow the passage of the off flavors will also allow some of the vapor of the lemon oil to be lost.

Poultry freezing after the war

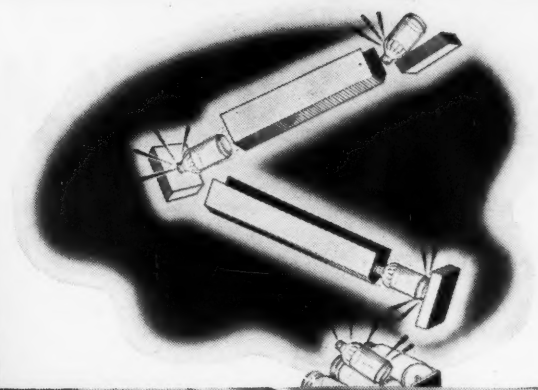
QUESTION: *I would appreciate any information you can give me on the freezing of poultry—as to preparation, equipment, temperatures and packaging. Can you send me the name of a company (or companies) who, after the war, might have available equipment for a small concern?*

ANSWER: I suggest you obtain a copy of the book, "The Freezing Preservation of Foods," by Tressler and Evers, published by the Avi Publishing Co. of New York City. This book gives complete and detailed information on the processing and packaging of all frozen products. It also lists manufacturers of all equipment and describes briefly the design and the operation. This book has an unusually complete bibliography which will enable you to obtain additional information on all phases of poultry freezing.

I suggest that you write the manufacturers of equipment for the answer to your question about the availability, costs, etc., of their product after the war.

"COMMANDO COURSE" FOR BOTTLES

Tests like this are part of research's constant efforts to make better glass



GLASS research isn't all chemical equations and mathematical formulae. Armstrong's research men devote considerable time to physical testing of our product. Many of the tests are in addition to the usual procedure and are hard-boiled, practical affairs that subject the glass to more severe conditions than they would be subjected to in actual use.

For example, when Armstrong's Laboratories wanted some additional data on the mechanical strength of certain bottles, they built what could be called a "Commando Course" for bottles. Starting at the top of this structure, the bottle first dropped a foot and banged its shoulder against a hard block.

Then it raced four feet down a steeply inclined chute and smacked

its finish against another hard block. Four feet down another chute, it bounced its bottom against a block, dropped a foot, and rolled on its sides three feet down an inclined "washboard" made of bottles. After each "run," the bottle was given a thermal shock by immersion, first in hot and then in cold water.

There weren't many unanswered questions about the ability of Armstrong's Bottles to "take it" after each one had been subjected time and again to this gruelling ordeal!

Practical, thorough tests like this are typical of the research con-

stantly being conducted by Armstrong's chemists, physicists, and engineers. Their active interest in the practical as well as the theoretical aspects of glass production is one of the big reasons why Armstrong's Glass has been, and will continue to be, top quality.

Further interesting facts about the patience, skill, and experience devoted to the making of fine glass are presented in Armstrong's booklet, "Men and Glass." For your free copy, write Armstrong Cork Company, Glass and Closure Division, 5903 Prince St., Lancaster, Pennsylvania.



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and **ARMSTRONG'S CLOSURES**



Equipment and Materials

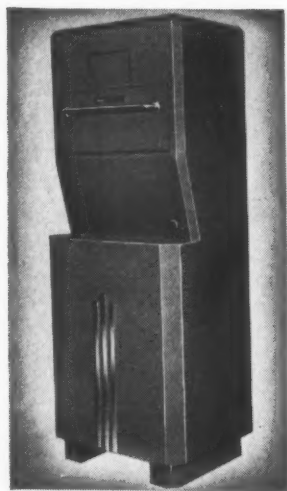
NEW PLASTIC FILM FOR PACKAGING

A new plastic film was added to the packaging list last month when the Goodyear Tire & Rubber Co. made public announcement of its "V-Film." Developed in Goodyear's research laboratory, V-Film is represented as being not a substitute but an alternative in some packaging applications with Goodyear's Pliofilm. V-Film is a derivative of polyvinyl chloride; Pliofilm is based on rubber hydrochloride. The new film can be produced on equipment installed originally for Pliofilm. Although not the equal of Pliofilm in some respects for moistureproof packaging, V-Film is described as superior in tear resistance and in several other factors. It is expected that high resistance to moisture-vapor transmission will eventually be developed.

ALUMINUM COLLAPSIBLE TUBES AGAIN

Aluminum Co. of America, Pittsburgh, Pa., announces plans for resumption of the manufacture of aluminum collapsible tubes for a variety of civilian and military needs. The increase in aluminum production, creating a growing surplus over and above military needs, has resulted in a revision of Conservation Order M-115 permitting the manufacture of aluminum tubes for certain drugs, ointments and dental cleansing preparations.

X-RAY MACHINE FOR PACKAGES



The Norelco Searchray Model 80 developed by the North American Philips Co., Inc., industrial electronics equipment division, New York, has been designed primarily for rapid fluoroscopic inspection of small packages, parts, molds, castings, ceramics and plastics, and may be used in the factory as well as the laboratory. So simple is its operation, that the X-ray viewing may be performed with safety by unskilled personnel, through an eye-piece to a mirror at 45 degrees, to a Patterson B type screen which has a viewing area of 8½ in. by 11½ in. The entire apparatus is contained in a cabinet which may be moved from

one department to another, or from the production line to the laboratory. Its exterior dimensions are 19 in. by 26 in. by 70 in. high.

The advantages of fluroscopic inspection of packages were discussed at length in the article "See-Through Inspection with the Fluroscope," MODERN PACKAGING, September 1943, page 66.

POLYETHYLENE, POSTWAR PLASTIC

A new plastic, with postwar potentialities for the packaging field, is polyethylene, manufactured by the polymerization of ethylene gas. Presently restricted to direct war uses—principally as a covering for electric wiring and cable—the new thermoplastic material is said to have unusual flexibility and toughness over a wide temperature range; exceptional resistance to water and to penetration by moisture, and chemical inertness. In thin sections, it may be classified as non-rigid; yet it does not have the limp, rubbery quality that characterizes most non-rigid plastics. Thick specimens exhibit sufficient stiffness to warrant classification among the more rigid plastics. It is readily molded and

fabricated by present methods with existing equipment. Possible future packaging uses will be various types of containers, including collapsible tubes for food and cosmetics; waterproof and chemically resistant coatings, and adhesives. Based on initial research by Imperial Chemical Industries, polyethylene is being manufactured in commercial quantities by E. I. du Pont de Nemours & Co., Inc.

TEST KIT IN CARRYING CASE

A Miskella Infra-Test-Kit contained in a carrying case, which may be used as a table while testing, has been developed by the Infra-Red Engineers & Designers, Cleveland, Ohio. The kit complete weighs 30 pounds and measures 36 in. high, 12 in. wide and 12 in. deep. Standard wiring is 115 volts, and operates on either AC or DC current. It supplies temperatures from 70 deg. F. to 400 deg. F., heat units being insulated with compressed Fiberglas 1 in. thick. Either clear or reflector lamps may be used. The kit has practical applications and uses, the manufacturers state, in chemical, plastics, ink, glass, paint, adhesives and many other laboratories.

BULLETIN DESCRIBES PACKAGING MACHINES

Triangle Package Machinery Co., Chicago, Ill., has issued a new 20-page bulletin describing and illustrating their complete line of weighing, filling, measuring and carton-sealing equipment. The illustrations are actual installation photographs in divers packaging plants. Details are given on production rates, methods of handling goods and other pertinent data. Copies of the bulletin are available upon request to the manufacturer.

DEVELOPMENTS IN FURFURAL RESINS

Authorities in the plastics field predict important developments, in the not-too-distant future, in commercial applications of furfural plastics. One hundred per cent furane resins which can be molded, laminated, cast, sprayed as air-drying coatings and used as adhesives and impregnating agents have been developed experimentally. Present commercial price of furfural is around 10 cents a pound. Furfural resin has a peculiar ability to penetrate and to act as a solvent on materials to which it is applied, making it unusually adaptable to molding with various fillers and to use as an adhesive, laminate, coating or impregnant. Striking surface appearance as well as solid structure may be obtained when it is used as a laminate with paper, pulp or canvas.

COLOR AND HUMAN REACTIONS

From the Color Research Laboratory of the Eagle Printing Ink Co., Div. of General Printing Ink Corp., New York, come a few notes on the phenomena of colors apparently speeding up or slowing down the general reactions of the human mind and body. The latest booklet issued by the company, "Color in the War," contains such articles as "The War Front," by Egmont Arens; "The Production Front," by Faber Birren; and "Printing and Morale," by Fred G. Rudge. Copies may be secured by writing direct to above-mentioned company.

NEW GROUP OF POLYVINYL RESINS

The Chemical Division of The B. F. Goodrich Co., Akron, Ohio, announces it has developed a group of polyvinyl resins known as the GEON 202 and 203 series. The new GEON 202 series was created to meet the need for polyvinyls which combine increased solubility and thermoplasticity with (Continued on page 224)

A TOUGH WAY TO LEARN VALUES...



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Announcing 4 Products for the control of moisture-vapor transmission

Darex Thermoplastic Coating Materials give tough, continuous, moisture-resistant films for the safe packaging of hygroscopic and moisture-sensitive products. Since the introduction of the first Darex coating in 1937, they have been used on millions of packages with an enviable record of success. In response to wartime demands, they have come to the rescue in solving many urgent problems in packaging critical war materials.

Darex Thermoplastic Coatings are not to be confused with ordinary waxes. They are made from selected blends of wax which have been reacted with complex non-waxy materials to yield homogeneous, tough, film-forming products. They are stable throughout the operating range of their use and do not separate, stratify, or throw out in the melting tanks. They vary from hard, non-blocking films to soft, permanently plastic adhesives, all of which are sealable under heat and pressure.

Right now, restricted amounts are available for a few additional customers. After the present emergency, Darex Thermoplastic Coatings will be available in unlimited quantities.

We don't claim that these products are a cure-all. Competent box-making and sealing are also necessary. However, in view of the success we have had in solving critical problems, isn't it worth your while to talk over your plans with one of our engineers?



DEWEY AND ALMY CHEMICAL COMPANY

Cambridge, Massachusetts

Chicago

Oakland

Montreal

DAREX THERMOPLASTIC COATINGS

P-15 Group

Uses: Outside dipping of finished cartons, either single or double dip.

Inside-outside dipping of cartons (DACCA process) before packing.

Can be used to coat any package from 10 cu. in. to 850 cu. in.

Properties: Viscosity range 20-50 cps. @ 175°F.

Flow point 135°-145°F.

Suitable for extremes of 140°F. to -20°F.

Give hard, transparent, smooth, continuous film.

Moisture-vapor transmission through correctly sealed and constructed cartons, less than 0.10 gm./100 sq. in. in 24 hrs. @ 100°F. 90% R.H., as measured by anhydrous CaCl₂ pack.

Average covering approximately 11-20 gm./sq. ft. of surface.

AM, BM, CM Group

Uses: Coating collapsible tubes.

For inside coating of fiber containers for hot packs, jellies, and jams, up to 170°F.

Properties: Viscosity range 23-33 cps. @ 230°F.

Flow point 155°-175°F.

Resistant to pH of 3.5 to 12.

Have great flexibility, strength, adhesion to metal.

158-P Group

Uses: Heat-sealable coatings for special papers, glassines, cellophane.

Properties: Viscosity high, suitable for coating work.

Flow point 150°-160°F.

Flexibility and adhesiveness over wide range of temperatures. Translucent coating.

Moisture-vapor transmission less than 0.10 gm./100 sq. in. in 24 hrs. @ 100°F. 90% R. H.

60-P Group

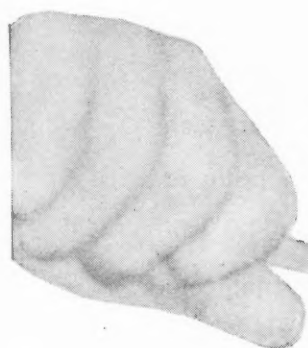
Uses: High-viscosity laminating adhesives for glassines, cellophane, special papers.

Properties: Viscosity extremely high.

Give transparent, permanently soft plastic film, with high tensile strength and permanent tack. Due to high viscosity, will not delaminate under heat. Spread approximately 5-20 lb./ream (24 x 36—500).

DAREX THERMOPLASTIC COATINGS

Is the can that put new foods in life rafts
to provide
new foods for baby?



● Have you heard about the Army's new life-raft ration?

Sugar and vitamin concentrates—they give energy and moisture; even steady the nerves. They're packed in an easy-to-open can, designed to be rolled up in an emergency rubber raft.

Chances are you'll never need this scientific ration. But your baby will benefit by its contribution to nutrition. How?

Thanks to the kind of research that today is producing such war-born necessities, he'll enjoy a wider variety of healthful foods someday.

Baby food in cans has already done wonders in building the growth and health of youngsters. You can

count on the baby food people for many more new and better foods.

And they'll come in cans! Because cans *protect* and *preserve*. They're sturdy, convenient, safe.

Our main job now is war work, but there's no priority on imagination. That's why we're sure that in the peace to come, you'll have *new and better things in Continental cans!*

POST-WAR PLANNING HELP: We will be glad to discuss possible future uses or improvements of your product or package, and to help make plans. Write to our Post-War Planning Department, 100 E. 42nd St., New York City.

CONTINENTAL CAN COMPANY
NEW AND BETTER THINGS IN CONTINENTAL CANS





New Frontiers to Conquer

Today's frontiers are a challenge to Yankee ingenuity! We, of the Sefton Fibre Can Company, are exploring new paths of endeavor...seeking new ways to solve your package problems. We're testing and experimenting with new materials so that you may have the finest. We're conquering new frontiers today so that you will have the ultimate in packages tomorrow!



FIBRE CAN COMPANY
ST. LOUIS NEW ORLEANS

THE PACKAGE OF TOMORROW

Visit the Sefton Display
AT THE
A. M. A. PACKAGING EXPOSITION
BOOTH 516 * PALMER HOUSE
CHICAGO * MARCH 28-31

DISTRICT OFFICES: Los Angeles San Francisco Denver Tampa Chicago Des Moines New Orleans Boston Detroit Kansas City St. Paul
Omaha New York Cincinnati Cleveland Oklahoma City Pittsburgh Memphis Nashville Dallas Houston Salt Lake City Seattle

Samples

TO STIMULATE YOUR THINKING



We can't show you our entire line of fancy papers—there are many too many for that.

The samples we do offer on this page may serve as an introduction to our line of embossed finishes, waterproof papers, mica and flint surfaces. And they are shown in the further hope that they may stimulate your thinking—or the planning of your package designer—into some new and productive channel.

We will be glad to send you other samples of the work of our English and American mills to help you visualize your thoughts.

KUPFER BROS. CO.

NO. 4 ASTOR PLACE

NEW YORK 3, NEW YORK

KUPFER BROS. PAPER CO.

145 WEST HUBBARD ST.

CHICAGO 10, ILL.

St. Paul

Seattle



Keeping An Art ALIVE

Post War appeal of fine things—beautiful items of quality—will be greater than ever before—

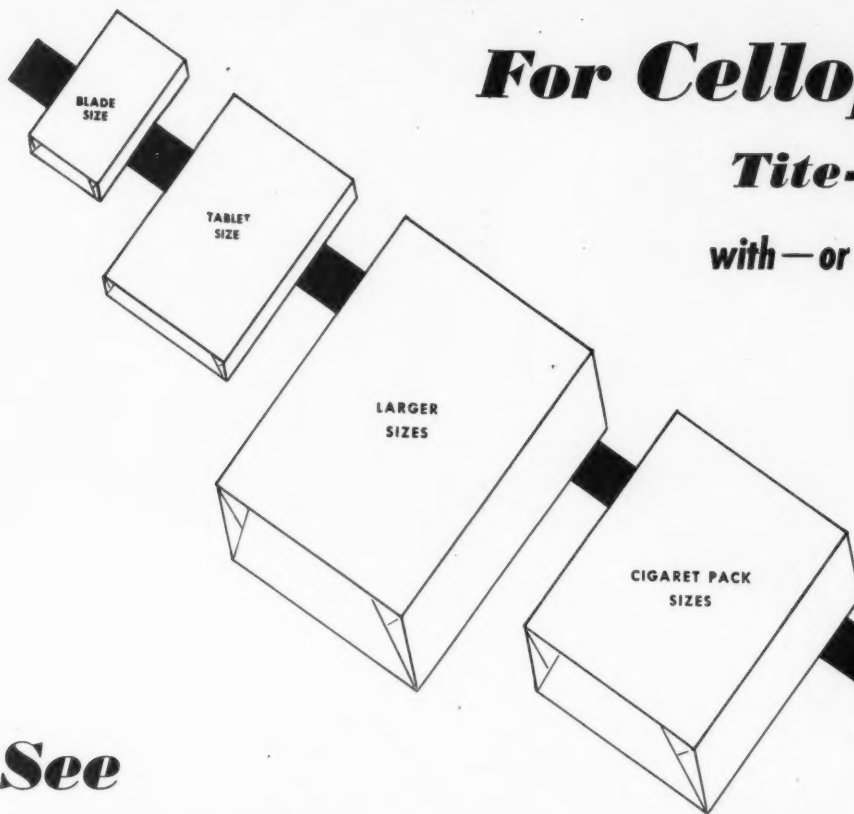
The Smithcrafted process, with the added advantage of newly developed materials—will be utilized even more extensively than in the past for the reproduction of beautiful art effects in deluxe gift packaging.

The value impression of old established arts—which are so beautifully reproduced, in quantity and quality, by the Smithcrafted process—is and will increasingly be of highest sales appeal.

THE S. K. SMITH COMPANY
2857 N. WESTERN AVE. CHICAGO, ILL.

New York Office, 52 Vanderbilt Ave., MUrray Hill 9-8290





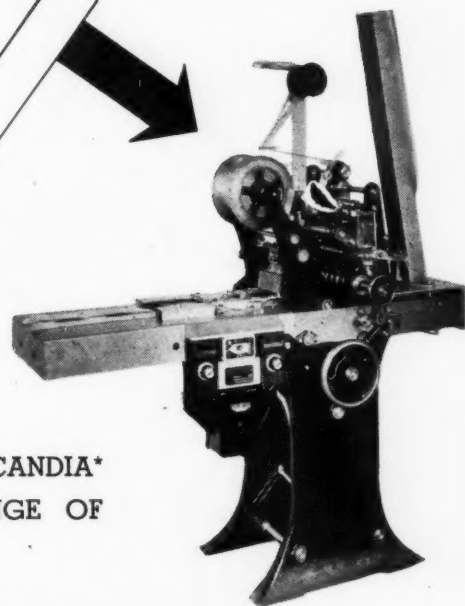
For Cellophane

Tite-wraps...

with—or without TEAR-STRIPS—

UP TO
350
per minute!

**See
Scandia—
before you decide...**



**If YOU Have
A "Packaging Problem"**
For 26 years we have been
instrumental in designing
and supplying Special Per-
formance machines to meet
and overcome excessive
production cost, or achieve
stepped-up capacity. Call
Scandia—for proof and for
discussion.

THERE IS A STANDARD SCANDIA*
UNIT FOR A WIDE RANGE OF
PRODUCTS...

ANYTHING that needs the protection
of tight, cellophane wrapping, or the
product-prestige of transparent mois-
ture-proof cellophane... if produced in volume, can be
wrapped the snug, secure *Scandia* way. Machines for this
type of work are widely used. *Inquire about them, NOW!*

Of course—we are still doing vital War Work, but it isn't too
early to get data for post-war packaging problems...

* Manufactured under Bronander Patents.

Ask for details! Our Packaging Engineers are at your service.

Scandia MANUFACTURING CO.

NORTH ARLINGTON

NEW JERSEY

MARCH • 1944

179



Congratulations

ON A FINE JOB, WELL DONE!



**LET'S ALL KEEP
BACKING THE ATTACK
WITH WAR BONDS**

THE Treasury "Star" Flag—the bond-buying counterpart of the Army-Navy "E"—marks plants with at least 90% of personnel participating in the Payroll Savings Plan to at least 10% of gross payroll, and also having reached, or topped, a War Loan Drive quota!

The successful close of the 4th War Loan Drive finds many more "Star" Flags than ever before flying over the industrial plants of America. To all these, go the heartiest thanks of the nation, and the deep appreciation of the Treasury Department for a great job! And to those who may not quite have qualified for the "Star," go equally sincere thanks—and the confidence that soon they, too, will join the ranks of the "Star" fliers.

One thought that many concerns have

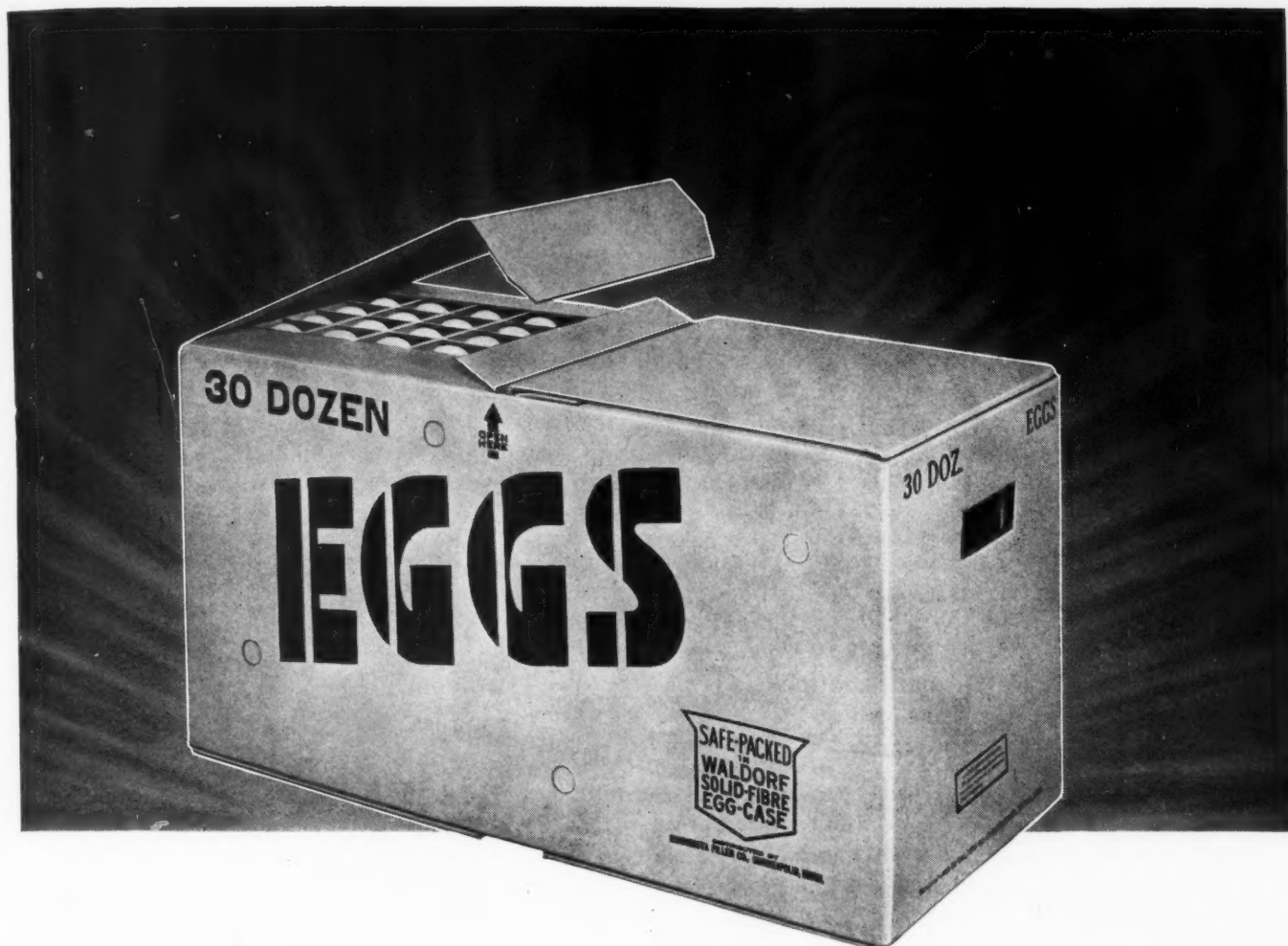
found helpful in stepping up the intake from their Payroll Savings Plans is this. In many cases the Treasury Representative in a plant has been able to point out the fact that during *Loan Drive periods* the employees have found it possible to spare much more than they had counted on when setting up their original subscription, and that—*when properly approached*—a very substantial fraction of such employees will decide they can well afford a distinct increase in their current Payroll Savings Plan.

Talk this over with your Treasury Representative—it offers important possibilities when correctly handled. And again accept the Treasury Department's congratulations for your fine work in helping to put over the 4th War Loan.

The Treasury Department acknowledges with appreciation the publication of this message by

BRESKIN PUBLISHING CORPORATION

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council.



FOR THE SAFE TRANSPORTATION OF
SHELL EGGS...A PRODUCT OF WALDORF
RESEARCH. To this case we proudly affix the
label of . . .

WALDORF PAPER PRODUCTS COMPANY

SAINT PAUL, MINNESOTA



"WHOSE BUSINESS IS THE DEVELOPMENT AND PRODUCTION OF GOOD PACKAGING"

ROYAL'S "FLAV-O-TAINER"

U. S. PATENTS NOS. 2,234,051; 2,234,065; 2,256,506

*If your present package
needs replacement let our
art department submit
color sketches without
obligation—*



"FLAV-O-TAINER" bags with glossy four-color printed wrappers and completely heat-sealed lining, provide an efficient, attractive package for products requiring great protection against gain or loss of moisture, at about one half the usual cost.

THOMAS M ROYAL & CO

PHILADELPHIA 20

Manufacturers of a complete line of flexible packages with air-tight, moisture-proof, heat-sealing features—glassine, cellophane, laminated and coated specialties—letterpress, rotogravure and aniline printing.

Help yourself to Samples at Booth 307 - Packaging Exposition

Excerpts from a few of more than 100 reviews of 1943 Packaging Catalog

"If there's any single reference work that should be given a favored spot on the shelves of every merchandiser's and manufacturer's library that volume should be the PACKAGING CATALOG for 1943. Answers dozens of problems that every war-time manufacturer must face . . . answers that aren't ordinarily easy to find."

—OFFICE APPLIANCES

"Spreads elaborate, first-hand information on the many ingenious packages developed for rations, munitions, ordnance, and civilian supplies since America entered the war. Covers its field all the way. Ambitious, quite complete, timely, a fine example of modern printing art."

—INTERNATIONAL CONFECTIONER

"Contained between the covers of this large volume is an extensive amount of usable information for those concerned with the packaging of foods and regulations, laws and standards affecting packaging."

—FOOD INDUSTRIES

"The PACKAGING CATALOG, issued annually is the 'Bible' of the container industry."

—RETAIL EXECUTIVE

"PACKAGING CATALOG war-time edition digests experience in packaging for war. Based on first-hand information gathered in hundreds of packaging plants and on the fighting fronts."

—NEW EQUIPMENT NEWS

"... a manual to help makers and users of packages adjust themselves to war-time conditions."

—AMERICAN PERFUMER & ESSENTIAL OIL REVIEW

"It gives the basic facts about every type of material, the permanent truths upon which packaging executives rely in handling their packaging operations."

—SALES-LITHOGRAM

RECONVERSION is theme of new 1944 PACKAGING CATALOG

The forthcoming 1944 PACKAGING CATALOG to be published in April will be based on the theme of reconversion. All war-time experience and knowledge and new war-time developments will be treated from the point of view of present utility and post-war possibility.

Written by literally thousands of experts in every branch of packaging, collated and edited by a board known for its thorough-going research and reliable reporting, the 1944 PACKAGING CATALOG will encompass all information every packager must have to carry on the war and to plan for peace.

In its 15 sections the CATALOG will cover every type of packaging material now on the market, including all the war-time developments. It will deal with every type of package used in war and merchandising from tiny glass vials to huge metal drums and taking in all of the many moisture vapor-proof materials and methods developed since Pearl Harbor. It will treat of every packaging machine, all known techniques, packaging law and related subjects. Its special Buyers' Directory will furnish the single authoritative and reliable guide to the more than 200 goods and services used in packaging operations.

The 1944 edition will be considerably larger than the 1943 book. At least 50% of the editorial contents will be brand new and the remainder will be completely re-written, re-edited, re-explored and re-illustrated.

Since the number of copies is limited by the WPB paper order, the publishers urge you to place your order now and avoid disappointment.

In spite of its increased size and the increased production cost, there will be no advance in price.

ORDER NOW! price \$2.50

PACKAGING CATALOG

**122 EAST 42nd STREET
NEW YORK 17, N. Y.**

Section Headings

(Each Section Contains Many Separate Articles)

**PLANNING FOR
RECONVERSION**

•

PACKAGE PLANNING

•

PACKAGING LAW

•

**PACKAGING FOR
GOVERNMENT ORDERS**

•

CARTONS & BOXES

•

**BAGS—ENVELOPES—
POUCHES**

•

**GLASS—POTTERY—
CLOSURES**

•

CANS & TUBES

•

**LABELS—SEALS—TAGS
—MARKING PIECES**

•

**PACKAGING IN
PLASTICS**

•

ADHESIVES

•

**WRAPPINGS—
COATINGS—
LAMINATIONS**

•

**MACHINERY &
EQUIPMENT**

•

**PACKING FOR
SHIPMENT**

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MERCHANDISING

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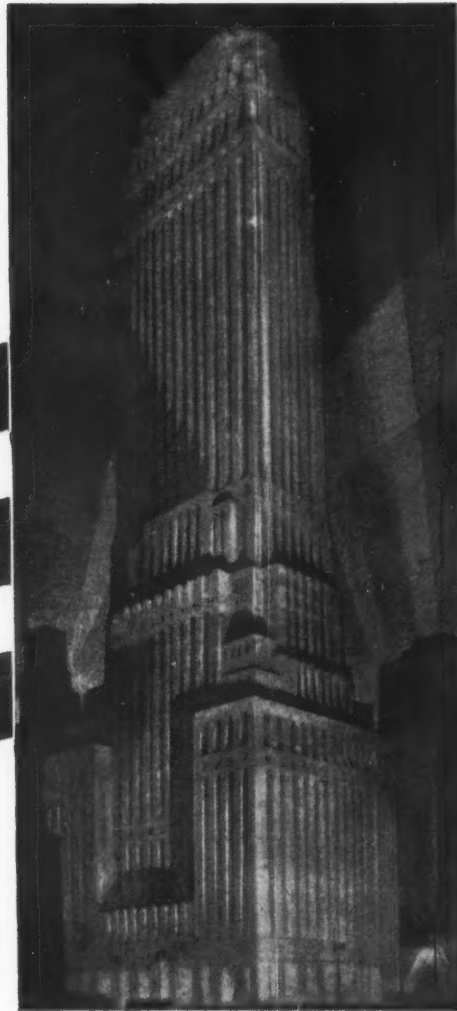
INDEXES & DIRECTORIES

Most

Convenient

Location

In Town



OPPPOSITE GRAND CENTRAL . . . direct entrance through building to Railroad Terminal—Baltimore and Ohio Motor Coach Station, and train platforms of three subway lines . . . a 56-story "landmark" building with a tenant roster that includes many of the proudest business and professional names in America.

The Chanin Building is served by 21 high-speed elevators, and for the convenience of tenants, a 200 seat Auditorium is located on the 50th floor.

Your office requirements, be it an entire floor or a smaller unit, are available for immediate or future possession.

Our architectural department, upon request and without obligation, will present plans drawn to the exact requirements of your own business or profession.

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A Nationally Known Address—"at New York's Front Door"

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MANAGEMENT, INC.



Win the War in '44



PATRIOTIC BOX COVERING PAPERS HELP

THE WAR EFFORT, TOO. WE HAVE SEV-

ERAL STIRRING DESIGNS WHICH WILL

ADD SUCH A WELCOME, TIMELY TOUCH

TO YOUR PACKAGING. JUST ASK FOR

SAMPLES OF OUR PATRIOTIC PAPERS.



This sample Pattern 742-E White Kromekote base

ROYAL PAPER CORPORATION

Manufacturers of Decorative Papers

210 Eleventh Avenue

New York 1, N. Y.

NEW METHOD OF PACKAGING . . BY PIONEERS IN PROTECTIVE COATINGS

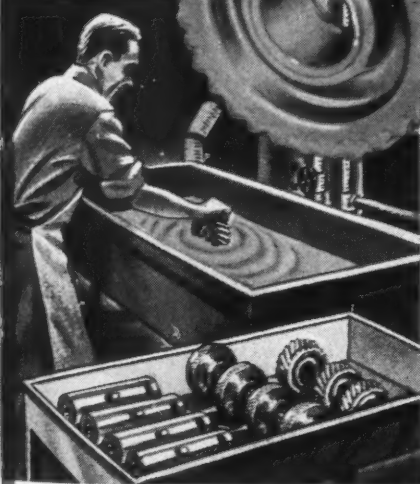


Ethylseal

FOR THE PROTECTION OF
METAL PARTS

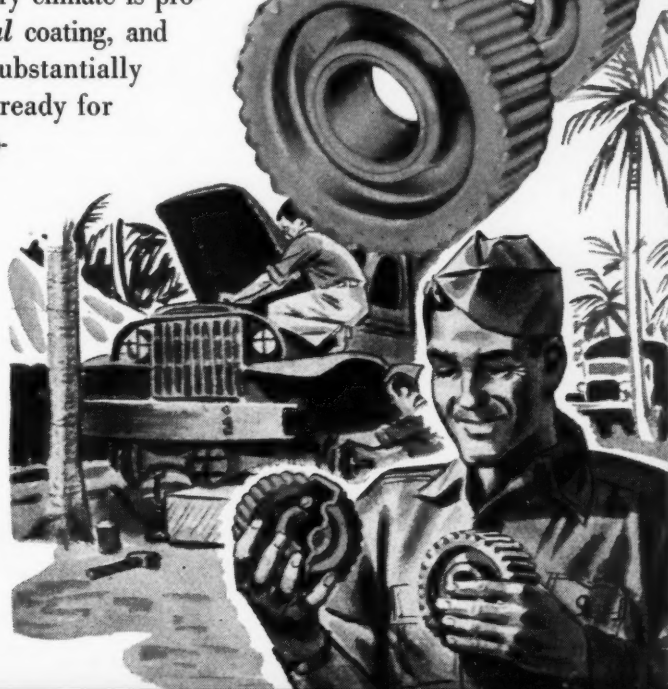


From Dip Tank to Battle Front:



Metal parts are dipped in hot melt *Ethylseal* which forms a strong, durable, moisture-resistant coating, having no adhesion to the part. Protection in every climate is provided by the *Ethylseal* coating, and packaging costs are substantially cut. Parts are made ready for service by simply stripping off the coating.

POST WAR USES *Ethylseal*, in peace time, will have many applications for the protection of parts for automobiles, agricultural implements, business machines and hardware items. Why not start now to investigate the possibilities of *Ethylseal* packaging for your post war products?

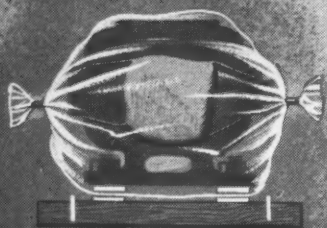


PONTIAC VARNISH COMPANY

PONTIAC

MICHIGAN

Manufacturers of PVC-9-R Package Dip Sealer (wax) for export packaging



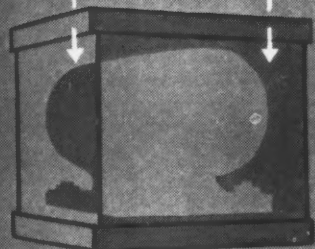
Saran film

KEEPS MOISTURE IN ITS PLACE



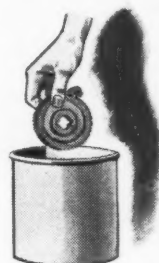
TOUGH TRANSPARENT FILM SOLVES THE MOISTURE PROBLEM

Rapid development of moisture-vapor barriers is a prominent example of chemical achievement. Saran Film, Dow's new colorless, transparent flexible sheeting—now protecting precision military equipment from dirt and corrosion—is ideally suited to the diversified requirements of the packaging industry. It possesses high impenetrability to water-vapor—is tough and serviceable at subzero temperatures—retains its excellent physical properties after aging and exposure. Saran Film is recommended for use where high chemical resistance and extraordinary film strength are needed. You can count on Saran Film to "Keep Moisture In Its Place."



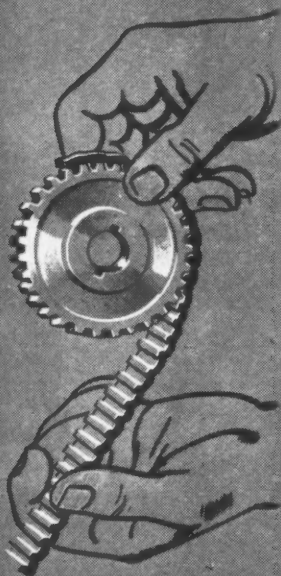
Stripcoat

DIP IT • SHIP IT • STRIP IT



HOT MELT DIP PROTECTS METAL PARTS

Newest, and perhaps most spectacular of recent packaging accomplishments, is Stripcoat. This Dow product, a specially developed hot melt dip, protects metal parts by giving them a quickly applied, easily removed skin or coating. Parts are simply cleaned then dipped in Stripcoat. The material "sets" immediately, forming a tough, waterproof, corrosion-resistant coat. En route, Stripcoat withstands temperatures ranging from -30° to 160° F. And at the final destination, the coating is easily removed by slitting with a knife and peeling with the fingers. Stripcoat is chemistry's answer to the need for better, faster packaging.

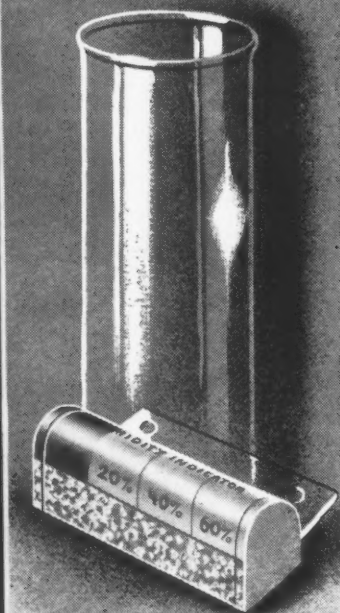


Ethocel Sheeting



RIGID TRANSPARENT PACKAGES WITH SMART SALES APPEAL

Ethocel Sheeting made its debut in the packaging industry before the war. It quickly earned a reputation for unusual toughness and durability among rigid transparent sheetings. Made of Dow Ethylcellulose, it possesses properties that give it inherent flexibility and make it exceptionally clear. It does not easily warp or crack, and retains its shape under difficult storage conditions. Today, Ethocel Sheeting is stepping aside in favor of other more urgently needed Ethylcellulose war products (like Stripcoat). But package manufacturers and users will undoubtedly turn to it again for the production of easily fabricated, economical packages with smart sales appeal.



Dow products for better packaging include:

SARAN FILM • STRIPCOAT • ETHOCEL SHEETING



*You are invited to visit
The Dow Exhibit
AT THE PACKAGING SHOW
March 28th to 31st
The Palmer House, Chicago
RED LACQUER ROOM
SPACE NO. 816*

chemistry is the foundation of good packaging

Behind nearly every phase of the huge packaging industry is the driving force of chemical progress. In recent years spectacular advances have been made in many new products—transparent films, special coatings, plastics—and in each case, the work of chemistry is evident.

Packaging men, as well as the general public, are aware of these important contributions. But beyond this line of products, the role of chemistry in packaging is not so well known. Here, it works unheralded—constantly striving to improve the materials and “tools” upon which good packaging depends. Chemicals make better inks, new types of glass,

improved paper. They act as dehumidifiers, mold controls, solvents and plasticizers.

To all of these products—and many more—Dow has long been a major contributor. Dozens of materials, ranging from Dowmetal for printing plates to Dowicides for mold growth prevention, have added to packaging progress.

Drawing from such experience, Dow has developed three products, designed expressly for better packaging. They are Saran Film, Stripcoat and Ethocel Sheeting—outstanding examples of chemistry’s contribution to good packaging.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Washington • Philadelphia • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle

Dow announces the opening of a Detroit office to serve this important industrial area

DOW
PLASTICS



WASHINGTON REVIEW

by R. L. Van Boskirk

● **An Amendment to L-317**—which may be out before we get to press—is the crowning blow to any doubters who may have felt that re-use was simply a job thought up by WPB to keep a lot of people busy. The new amendment, as predicted in this column last January, will add a considerable number of restrictions to the original order. First, it will add a considerable number of items for which no containers will be allowed, and second, it will lower the base period percentages so that many items now allowed 80 per cent will be reduced to perhaps 60 per cent and the 60 or 65 per centers will go even lower than at present.

Unless shippers can find some kind of container their business will certainly suffer. The best bet they have is to cooperate and use their ingenuity in finding ways to use old containers.

Another development in the re-use campaign is continued pressure to use less glue. Officials advise spot gluing. It saves glue, makes boxes easier to open without damage and results in a greater number of re-usable containers.

There is also some talk about revising the steel strapping order M-261 which prohibits its use on less than 90-lb. boxes. If steel strapping could be used on smaller boxes they would be better protected and more of them would be available for re-use.

Another drive is being put on to encourage users of fruit and vegetable boxes to stock up at once. Used stocks are threatening to clog up dealers' warehouses, and farmers are being asked to take them off their hands immediately so that the dealers may go out and replenish their supply.

In the dentifrice market, there has been considerable confusion because some manufacturers were continuing the use of small-size containers in order to please purchasers of small quantities of dentifrices. Those who had gone to larger cartons complained because they were losing their small-quantity customers. Now they have all come to an agreement to use only larger-size cartons.

Getting back to L-317 it should be noted that several changes were made in the order before the sweeping changes which are about to be announced. We call attention to these changes in order to show that WPB has no intent to be arbitrary

and is more than willing to listen to reasonable protests. Container officials are making a notable effort to be reasonable in dividing equitably a scarce commodity of which there is not enough to supply all needs. When the new order goes into effect there will be considerable grousing in industry circles, but by and large strenuous attempts will be made to avoid outright damage to any one field of business.

For example, when L-317 was first promulgated it was soon discovered that stationery could not be handled without undue confusion and hardship—the container situation was simply too complex for proper administration, so stationery was taken out of the order and is now being studied to find out how it can be more advantageously controlled. This example illustrates a reasonable attitude on WPB's part and although the new L-317 is going to be tough on container users, it also illustrates a tendency to play the game and meet reasonable appeals with a high degree of common sense.

● **Wastepaper Salvage Situation**—If paper board mills are to be kept in operation, full cooperation of the paper and paperboard industry with local waste paper collecting agencies and the general public in the salvage campaign is more than essential—it is now an acute necessity. The consumption demands for paper far exceed production. Paper has now become the No. 1 salvage material. If the 1944 goal of 8 million tons of wastepaper salvage is to be realized, $\frac{1}{3}$ more than the 1943 volume, a full cycle of salvage must be maintained from producer to consumer to producer. The hot breath of military shipping demands for container and packaging materials is constantly on the industry's neck. Waste paper is an essential material in the manufacture of many fibre shipping containers, comprising as high as 99 per cent of the substance of some boxes.

Eastern and western members of the wastepaper consuming industry have renewed their agreement to purchase at OPA ceiling prices all properly processed paper offered them.

Selective Service informed the WPB that temporary deferments could be obtained under the regulations by waste-

paper dealers for their personnel, and that dealers should make every effort to attract help from the ranks of older men, women, boys under 18, and discharged veterans of this war, and should even look into the possibilities of using paroled prisoners and prisoners of war.

The WPB Salvage Division announced the cooperation of the WPB field organization in helping the industry to present its needs to Selective Service, the War Labor Board, and the U. S. Employment Service.

● **WPB Paperboard Division**—The Paperboard Division of WPB Forest Products Bureau has made the following organization statement to facilitate the handling of questions regarding interpretations of its orders, policy, ratings and other information relating particularly to fibre containers and containerboard.

The Director of the Paperboard Division is G. G. Otto; his office is Room 2005, Temporary S. 6th and Jefferson Drive.

The Deputy Director is R. W. Whitney, Room 2007, Temporary S.

The Assistant Director, in charge of Containers and Containerboard Production, is Willard L. Davis, Room 2009, Temporary S.

All questions regarding corrugated and solid fibre shipping container production and Order P-140, covering preference ratings for fibre shipping containers, are handled by P. F. Paul, chief of the Fibre-Box Section, Room 2104, Temporary S.

Limitation Order L-317, covering the manufacture and use of fibre shipping containers, is administered by George McGowan, Room 2112, Temporary S.

The Chief of the Containerboard Section is W. M. Sawyer, who handles the administration of Order M-290, the Containerboard Order, and problems relative to containerboard production, Room 2102, Temporary S.

● **Brewing Industry Asks Bottle Replacements in 1944**—New bottles in 1944 to replace current losses were asked by the Brewing Industry Advisory Committee at a meeting in Washington in January with War Food Administration and WPB officials.

The committee, in requesting replace-

**"coming in on both wings
... AND A Flare!"**



In the pitch black darkness of a tropic night, it's hard to gauge how far down the surface of the seas may be... when you're flying thousands of feet in the air.

But Army and Navy pilots carry drift signal flares made by Triumph Explosives, Inc., of Elkton, Maryland, which are dropped from the airplane... flare up on contact with the water... indicate how far down the surface is... and show the wind direction and speed. These flares have proved invaluable for both emergency landings and on routine flights.

And where does Crown come in? Just take a look at the metal fins of the base in the close-up. Crown makes those for Triumph Explosives... a job far away from Crown's normal peacetime production... but a job that "illuminates" one more way Crown Can is working to win the war!

CROWN CAN COMPANY, New York • Philadelphia.
Division of Crown Cork and Seal Company, Baltimore, Md.



★ ★ **CROWN CAN** ★ ★

ments of bottle supplies, pointed out that breakage and other losses would deplete present container stocks to such an extent that brewers might find it impossible to market all the beer they produced in 1944. The group asked that brewers be allowed to purchase as many bottles in 1944 as in 1943.

Enough bottle tops to take care of all bottles made available to the industry in 1944 were assured by the committee, as brewers have been authorized to use 15 per cent more closures.

● **Animal Glues Placed under Control**—With the nation facing an estimated reduction of 25 to 35 per cent in hide glue supplies, the WPB on January 27 placed animal glues under a conservation order for the first time.

Full production on the 1943 scale will be permitted in only two fields—abrasives, including sandpaper and emery cloth essential to the manufacture of machine parts, and gaskets, which are essential components of the internal combustion engines of airplanes, tanks and torpedo boats.

Because of the availability of substitutes, WPB officials said the percentage reductions ordered in animal glue consumption would not effect equivalent reductions in output in the regulated fields. Acceptable adhesives with casein, resin or starch bases are in supply for practically every item but match heads, WPB said.

To channel all hide trimmings and fleshings into the production of glue, WPB announced that it had forbidden the use of certain types of gluestock for the production of gelatin, edible or inedible, and the use of other types of raw stock in fertilizer and other products for use in agriculture.

The order (Part 3293 of M-368) is expected to divert approximately 12,000 tons of hide stock to the production of glue. WPB estimates this will provide between 2,000,000 and 3,000,000 additional pounds of hide glue against an estimated 1944 shortage of 18,000,000 pounds. This shortage is attributed principally to a 30 per cent reduction in the number of available hides.

● **One-half Lumber Supply Going into Packaging**—More than 34,000,000,000 board feet of lumber will be needed to meet the war requirements of the nation in 1944. J. Philip Boyd, director of WPB Lumber and Lumber Products Division, told the West Coast Lumbermen's Assn. at its annual meeting recently held in Portland, Oregon.

Mr. Boyd made public the requirement estimates for the year for the first time. They included the minimum needs of the score of claimant agencies among which production is divided, the exact figures being confidential. In general, the estimates were: Shipping lumber, mostly lumber used in crating and packaging ma-

terials for shipment to the war fronts, 15,500,000,000 board feet, almost one-half of all production; construction for the Army, Navy, Maritime Commission and Air Corps, 5,500,000,000; railroads, utilities, mining and heavy industries, 6,500,000,000; farms, defense housing, all other essential civilian requirements, 7,000,000,000.

● **Package Wrappings**—Retail shoppers must expect to do with fewer package wrappings this year, according to Arthur D. Whiteside, WPB vice-chairman for Civilian Requirements.

"Total production of retail wrappings is expected to run at least 50 per cent under 1942," Mr. Whiteside said. "Americans will often be asked to carry home unwrapped purchases."

Last year, inventories forestalled the effect of the growing wrapping-paper shortage, but stores no longer have large reserves of wrappings and so must depend almost completely on current production. This will mean a sharp reduction in available quantity.

It is expected that civilian supply will include adequate quantities of absorbent wrapping paper used by butchers, a moderate supply of paper and variety bags for general wrapping purposes, and enough big bags for assorted groceries provided housewives save these bags and take them back to stores for their own re-use. The shopping bag with handles will be made in quantities at least equal to last year's, but must be used many times to substitute for individual package wrappings. Folding boxes, for apparel purchases, will be in considerable less than peacetime supply.

● **Canning Machinery Industry Advisory Committee**—Members of the Committee petitioned the General Industrial Equipment Division for permission to use monel metal, nickel, bronze and copper in certain contact parts of the machinery they manufacture.

In presenting their request the committee pointed out that the corrosion-resisting qualities of these metals would enable them to build machines that would not deteriorate so rapidly as has been the case when they used substitute parts made of carbon steel.

Present regulations, however, prohibit the use of these scarce materials in the fabrication of such machinery. The request has been taken under consideration by WPB, and an early decision is expected, which, if favorable, will be implemented by an amendment to the limitation order covering this branch of industry.

● **New Chief of Container Division**—Edward J. Detgen, of Washington, D. C., has been detailed from the Department of Commerce to WPB where he will act as Deputy Director of the Containers Division, Harold Boeschstein, Acting Director of the WPB Forest Products Bureau,

announced today. E. F. Tomiska resigned as Director of the Division, effective February 15.

Mr. Tomiska has been active in WPB affairs since 1942, becoming Director of the Containers Division last August. He will continue to serve as a WPB consultant and advisor.

Mr. Detgen has served WPB on several occasions in the past. In May 1941 he was loaned to WPB for four months when the Cork, Asbestos and Fibrous Glass Division was being organized. Again in 1942, he served as a consultant on container problems in the Beverage and Tobacco Division.

Prior to his assignment to WPB, Mr. Detgen was Chief of the Specialist Unit of the Department of Commerce.

● **Set-Up Boxes without Trimming**—Set-up paperboard boxes will probably be plainer in 1944, in view of the expected shortage of covering paper, the Paperboard Division of WPB has told the Set-Up Box Industry Advisory Committee. Suitable paper for covering and lining boxes, made almost entirely from pulp, probably will be less plentiful in the second quarter of 1944 than it is now. Some boxes may be produced in the rough.

Board used in this type of box is made almost entirely of waste paper and little wood pulp is required. Pulp allocations for the first quarter amount to 592 tons of pulp per month, from which a minimum of 63,016 tons of set-up boxboard is to be manufactured, approximating production of October and in excess of that in November 1943.

Two means of remedying the anticipated shortage of boxboard for making set-up boxes were discussed. They are:

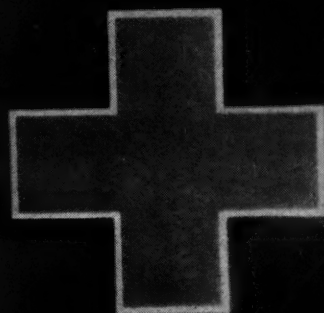
The extension of the restrictions imposed by WPB Limitation Order L-239, to balance supply with demands and avoid waste and unessential uses.

The establishment of a priority rating pattern for set-up boxes, similar to that controlling the use of fibre shipping containers, to insure adequate set-up boxes for military and essential civilian purposes and also to prevent abuses in usage of these boxes.

Discussion of these prospective remedies by members of the industry revealed that while the operation of L-239 had been largely effective in decreasing extravagance in uses of boxboard, and the voluntary efforts of both box users and manufacturers have been quite effective, it was the consensus that the order should be extended to make further savings by adding new prohibitions in uses. Boxes are still being produced for both essential and non-essential packaging, which could be down-graded in boxboard and paper usage without jeopardizing their utilitarian purposes, members of the Paperboard Division said. A task committee composed of members from the set-up box, folding-

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box and boxboard industries has been appointed recently to study this matter.

● **Production and Outlook for Containerboard Folding and Set-Up Boxboard**—Total production of container board, folding and set-up boxboard for 1943 was 6,940,700 tons, based on actual production for the first ten months and estimates for November and December, according to James A. G. Pennington, Pulp and Paper unit, OCR. This figure shows an increase of 567,754 over 1942 output, but a decrease of 258,531 as compared to 1941 production. The high 1942 figure is attributed to the general buying rush prevalent throughout the commercial world.

Containerboard production hit a peak of 4,213,728 tons in 1941, dropping more than 500,000 tons in 1942. It is interesting to note that the 1942 drop in fibre box production was due entirely to a 21 per cent slump in corrugated box production, use of these boxes having remained more closely associated with the civilian economy. Conversely, solid fibre production increased 23 per cent because of the heavy demand for V-boxes.

The Government's March 1943 estimate of requirements for V-1, V-2 and V-3 solid and corrugated overseas boxes was equivalent to the consumption of 455,000 tons of kraft board and 207,000 tons of jute board. Since March, estimates have been raised to a total of 1,000,000 tons of container board, and if WPB Container Division's estimates prove correct, nearly 2,000,000 tons will be used.

Production of folding boxboard reached its highest level in 1943 with 2,023,700 tons. Despite WPB restrictions limiting the consumption and use of paperboard to the most essential requirements, military, Lend-Lease and civilian needs forced production up. Output in 1942 was approximately 5.5 per cent below the 1941 production of 1,797,735 tons.

Set-up boxes have never been as widely used as folding boxes, and production of set-up boxboard has averaged only about 60 per cent of that of folding boxboard. Production in 1943 was 858,000 tons, a considerable drop from the 1,187,768 tons produced in 1941.

● **Lack of Machinery Threatens Beverage Production**—Some beverage bottlers face severe curtailment of beverage production unless new beverage machinery and equipment produced in 1944 equals 20 per cent of the average annual peacetime output and the manufacture of maintenance and repair parts this year is increased to 150 per cent of the 1943 output, the Beverage Machinery and Equipment Industry Advisory Committee has informed WPB.

Manufacturers represented on the committee said that the industry as a whole has been engaged almost 100 per cent on war work for the past two and one-half years. As a consequence a large percentage of equipment now in bottling plants is badly

in need of repair and in some instances must be scrapped due to economic obsolescence.

● **Amendment to Conservation Order M-53**—In order to permit applications to be made for allocations of phenolic resins for use in printing ink WPB has amended its conservation order. Restrictions on phenolic resins has tended to increase demands for Maleic resins, the supply of which is now extremely small.

● **Glass Container Manufacturers Industry Advisory Committee Meeting**—Chief topics discussed at the meeting were availability of raw materials; rubber requirements; packaging of beer for military shipments overseas; transportation problems; and the glass container order, L-103-b.

About 70 per cent of glass containers require paper liners to effect sealing of the container. Unless sufficient amounts of newsboard, pulpboard and kraft are available for closure liners the industry will find it difficult to fill requirements for 1944, said members of the committee. They submitted a resolution urging consideration of this problem. Estimated annual requirements are: 12,000 tons of newsboard; 6,500 tons of pulpboard, and 5,600 tons of kraft.

Several changes were also made in the glass order (L-103-b) as amended January 27th. They are as follows:

Commercial users of glass containers who have more than one plant may apply a separate quota for each plant or group of plants, or a collective quota for all plants—whichever method of computation is preferred. They may also consider wholly owned subsidiaries in either of these two ways.

For apple cider containers, only new glass containers of 1/2 gallon and larger, used in 1943, may be included in computing the 1944 quota (100 per cent of 1943).

The method of computing 1944 quotas for new metal closures for malt beverages and non-alcoholic beverages is clarified. For closures subject to quota, the 1944 quota must be computed only on 1943 use, and this includes both those allowed by M-104 (revoked on January 4) and under grants allowed through appeal.

● **Waxed Paper**—Waxed paper of all types and grades other than household packages and wrappings for direct military use are under end use control regardless of the method of production according to WPB's Interpretation No. 1 (Feb. 15) to General Conservation Order M-241-a.

The method employed in consuming paper in the manufacture of the end-product is not a factor in the application of the order, the WPB explained. It makes no difference whether the paper is oiled or waxed as a separate converting operation as is generally the case, or

whether it is done on the paper machine, the interpretation states.

● **Prospects for Blackplate Containers**—It is practically certain that no additional blackplate will be available for metal containers during the second quarter. However WPB officials seem to have a hopeful feeling that small additional quantities of light weight blackplate for container use may be available during the third quarter of this year. Every effort possible will be made to make this possibility a reality in order to relieve the pressure on paper and fiber containers. The first items to be changed over when that time comes will probably be food items such as lard and cooking compounds. There is not much chance that such things as coffee, tobacco, candy and like items can be changed over at the same time. They will have to wait until more metal is available. The same thing applies to producers now packing in glass and fiber.

● **Cellophane Tightens Up**—The February 4th amendment to L-20 (cellophane) should be a warning to all users that cellophane is becoming more difficult to obtain. WPB officials believe that production will certainly not increase during the coming year. It is almost certain that there will be less cellophane for civilian use in 1944 than there was in 1943. Cellophane is engaged in the battle for wood pulp like all other cellulose products and in addition there are certain chemical shortages that effect cellophane manufacture. But perhaps the most significant reason for tightening up is the fact that military demands are constantly increasing.

It is true that the new amendment will provide additional cellophane for a few uses. Small dairies bottling less than 84,000 bottles a month are now permitted cellophane hoods. Other modifications permitted use of cellophane in the manufacture of a few rubber products, in the wrapping of unexposed commercial film and in wrapping certain chemicals. But on the whole, the amendment was far more restrictive than it was liberal. There will be no more cellophane allowed for decorative wrapping.

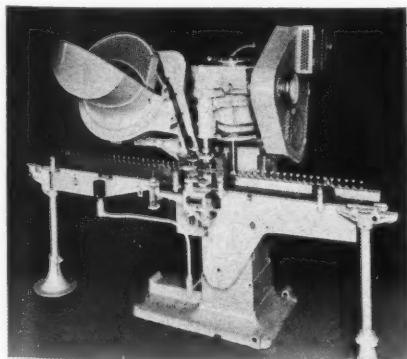
One of the more significant phases of the new order is that the amendment takes "off-grade" cellophane out of the waste clause in the order and puts it under complete control of WPB. The result is that there are now only two classifications of cellophane—"First-grade" and "Waste."

It should be noted that the new amendment also restricts users who have idle or excess inventories from disposing of it without permission from WPB. The order was also further amended to exclude all thin gauge sheeting, except cellophane, made from cellulose. Thin gauge sheeting was formerly included under both L-20 and M-326-a. (Cellulose acetate.) The order, as amended, includes cellophane only.

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U. S. patent digest

This digest includes each month the more important patents which are of interest to those who are concerned with packaging materials. Copies of patents are available from the U. S. Patent Office, Washington, at ten cents each in currency, money order or certified check; postage stamps are not accepted.

FOLDING BOX CONSTRUCTION. S. M. Libit, Chicago, Ill. U. S. 2,335,345, Nov. 30. A folding box construction comprising a bottom section having side sections formed integrally therewith.

LADY'S COMPACT. G. Rosenberg, New Rochelle, N. Y. U. S. 2,335,359, Nov. 30. A lady's compact comprising a rigid bottom and a pouch body, said rigid bottom comprising a disc-shaped piece formed on its interior wall with a cavity defining a powder and powder-puff well.

CARTON. W. T. Stearn (to Celanese Corp. of America, a corporation of Delaware). U. S. 2,335,366, Nov. 30. A carton for packaging of articles comprising four side walls formed of a rectangular piece, bottom flaps extending from only two opposite side walls a distance substantially equal to half the length of the other two sides and the height of the sides, and possessing only two top flaps.

COMBINATION CONTAINER AND DISPENSER. E. F. Shelton (one half to A. J. McDaniel, Los Angeles, Calif.). U. S. 2,335,363, Nov. 30. A dispensing attachment for containers having an opening in one wall thereof, a chute slidably engaging the sides of said opening and extending into the container.

PACKAGING MACHINE. F. B. Casey (to Dewey & Almy Chemical Co., North Cambridge, Mass.). U. S. 2,335,738, Nov. 30. Packaging apparatus comprising an open-ended expansion chamber, vacuum-operated means for lifting a package from the chamber, and including a retractable evacuating nozzle positioned over the open end of the chamber.

DUPLEX WRAPPING MACHINE. F. M. Fincke & L. Ferenci (to American Machine & Foundry Co.). U. S. 2,335,750, Nov. 30. The combination with a lifter table movable from a lower position to an upper position, two sets of tuckers on said lifter table, devices for guiding a pair of wrappers into positions in front of said table.

CONTAINER. C. H. Goodyear & B. P. Altick (to Fibreboard Products, Inc., San Francisco, Calif.). U. S. 2,336,088, Dec. 7. A container comprising a bottom, a wall, a sealing flap having a portion of its free edge only secured to said wall, a tab fold-

ably connected to the bottom and a tear strip in the unsecured portion of the flap and having an end secured to said tab.

HERMETICALLY SEALED BAG. A. B. Haslecher & H. A. Rohdin, Glen Ridge, N. J. U. S. 2,336,449, Dec. 7. A bag comprising a flattened tube of flexible material having front and rear walls, gusseted side walls and a closure at one end; said tube comprising an outer ply of paper and an independent inner ply of heat-fusible material.

CONTAINER. R. C. Carlson (to J. J. Emery of Emery Carpenter Container Co., Cincinnati, Ohio). U. S. 2,336,345, Dec. 7. A fibreboard container which is comprised of a circular wall portion forming a container body, an intumed flange portion integral therewith and forming a foundation for the closure of the body.

PAPER BAG. L. Coakley & H. V. Kindseth (to Bemis Bros. Bag Co., Minneapolis, Minn.). U. S. 2,335,844, Dec. 7. A bag made from a tube of porous non-moisture-proof material, one end of said tube being closed to provide the bottom of the bag.

PACKAGE OR CONTAINER. K. T. Buttery (to Sutherland Paper Co., Kalamazoo, Mich.). U. S. 2,335,913, Dec. 7. The combination of an outer container member comprising side walls and overlapping and interlocking bottom and top closure flaps.

CUP PACKAGE AND CARTON THEREFOR. K. T. Buttery (to Sutherland Paper Co., Kalamazoo, Mich.). U. S. 2,335,914, Dec. 7. A package unit comprising a plurality of tapered nested cups provided with rims, and a tubular carton open at the bottom receiving and embracing the rims of the nested cups with lower end of cup projecting from the lower end of carton permitting grasping thereof for withdrawal.

CARRY-HOME BOTTLE CONTAINER. W. F. Gies & W. J. Wells (to F. N. Burt Co., Inc., Buffalo, N. Y.). U. S. 2,336,857, Dec. 14. In an article container, in combination a sheet member having a bottom article support section, opposed walls rising above said bottom section, and having their upper parts adja-

cent to each other, and a handle flap at the upper part of one of said walls.

TRANSPARENT UNBREAKABLE NONREFILLABLE CONTAINER. T. B. McGirr & T. G. McGirr, Brooklyn, N. Y. U. S. 2,336,943, Dec. 14. A container of the kind described of cellulose material including a body and an integral conical top having an apex, and providing a bend at the junction of the top and body.

SLIDING CLOSURE FOR BELLOWS OR GABLE BOXES. W. A. Ringler (to National Folding Box Co., New Haven, Conn.). U. S. 2,336,503, Dec. 14. A carton or container comprising a body part provided with a dispensing opening defined by relatively stiff sheet material.

BAG. S. D. Andrew (to Bagpak, Inc., New York, N. Y.). U. S. 2,336,584, Dec. 14. A bag provided with a closure of the satchel bottom type at each end thereof, one of said closures being provided with a filling opening.

LOCKING CLOSURE FOR PAPER BAGS AND OTHER CONTAINERS. H. W. Nichols, Jr. (to The Security Bag Co., Lockland, Ohio). U. S. 2,336,630, Dec. 14. A shopping bag or like container having upstanding walls adapted to be brought into parallelism.

CARTON. L. H. Tobey & R. M. Holmes (to Bloomer Bros. Co., Newark, N. Y.). U. S. 2,336,655, Dec. 14. A carton made from foldable sheet material and having four side walls, one pair of opposite side walls having flaps at their tops folded inwardly from inner top closure flaps.

DISPENSING CARTON. F. A. Sunderhauf (to Reynolds Metals Co., Richmond, Va.). U. S. 2,336,706, Dec. 14. A carton having side walls, bottom closure flaps and top closure flaps including an uppermost flap provided with a pair of weakened lines extending from the outer end of said flap, and being provided with a tear flap or tab which when removed forms pouring opening.

DISPLAY CONTAINER. G. T. Henderson (to Hinde & Dauch Paper Co., Sandusky, Ohio). U. S. 2,336,731, Dec. 14. A corrugated board display container having integral side and back walls, a display back integral with the back wall and hinged to the top edge thereof.

CARTON. F. L. Broeren & P. E. Fischer (to Marathon Paper Mills Co., Rothschild, Wis.). U. S. 2,336,842, Dec. 14. A carton for retaining a roll of sheet material and dispensing lengths therefrom.

WRAPPING MACHINE. C. J. Malhiot (to F. B. Redington Co., Chicago,

HEEKIN COLORS

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FOUR puffs of colored smoke rise above the distant hills . . . four puffs of smoke that tell the artillery something important . . . four puffs of smoke whose colors were formerly used to lithograph beautiful colors on tin cans produced by the Heekin Can Company. Yes, the Heekin colors have gone to war but the men who produce Heekin Colors still experiment . . . still carry on the research that has produced better, more brilliant lasting colors on metal packages in the past . . . and will do so again in the future. No matter your packaging problem . . . tin will do it better . . . especially when it is lithographed with your design by The Heekin Can Company, Cincinnati, Ohio.



HEEKIN

Lithographed Cans
WITH HARMONIZED COLORS

III.). U. S. 2,336,795, Dec. 14. A wrapping machine for feeding packages continuously from delivery position to discharge position.

PACKAGE MAKING AND FILLING MACHINE. L. L. Salfisberg (to Ivers-Lee Co., Newark, N. J.). U. S. 2,336,962, Dec. 14. A packaging machine comprising the combination of means for forming opposed layers of flexible material in a bag-like container, and means for depositing a substance to be packaged through said open end into said container.

CARTON WITH SNAP LOCK BOTTOM CLOSURE. E. T. Gardner, Jr. (to Gardner-Richardson Co., Middletown, Ohio). U. S. 2,337,039, Dec. 21. A closure for tubular cartons having four walls, closure flaps articulated to each of said four walls.

CARTON. M. E. Holy (to Container Corp. of America, Chicago, Ill.). U. S. 2,337,198, Dec. 21. A self-locking end closure for cartons.

CARTON. M. E. Holy (to Containers Corp. of America, Chicago, Ill.). U. S. 2,337,199, Dec. 21. A carton or protector formed from a single blank of foldable paperboard.

PACKAGE. J. F. Broadfoot, Johnston, R. I. U. S. 2,337,370, Dec. 21. A generally rectangular laundry container comprising a relatively stiff collapsible cardboard outer box having two pair of opposite walls hingedly joined at their meeting edges.

BOTTLE CAP. B. M. Harvey & H. B. Harvey, Philadelphia, Pa. U. S. 2,337,241, Dec. 21. A bottle cap having a depending securing flange to embrace a bottle mouth and a sheet metal lever having one end portion integral with said flange.

COLLAPSIBLE TUBE. J. P. Nissen, Jr., Noble, Pa. U. S. 2,337,264, Dec. 21. A collapsible tube structure, including a collapsible tubular body having a forwardly extending internally tapered end wall and axially extending bore.

CAP APPLYING APPARATUS. L. E. Davies (to White Cap Co., Chicago, Ill.). U. S. 2,337,032, Dec. 21. A capping machine wherein vessels are moved progressively in a horizontal plane past a capping station and including sloping runway for delivering closure caps to capping station.

CLOSURE CAP FEEDING APPARATUS. L. E. Davies (to White Cap Co., Chicago, Ill.). U. S. 2,337,033, Dec. 21. An apparatus for feeding caps in com-

bination with stack rack for guiding a stack of closure caps.

PACKAGE FOR MILK AND OTHER FLUID PRODUCTS. S. H. Berch (to Flexible Container Corp. of Los Angeles, Calif.). U. S. 2,337,730, Dec. 28. A carton formed from a blank having four main parallel fields scored to provide the four walls of a carton and each field having sealing flaps at its opposite ends, same being provided with an inner liner.

CARTON WITH INTERLOCKING BOTTOM. A. P. Lapara (to Great Southern Box Co., Inc., Southport, La.). U. S. 2,337,755, Dec. 28. Carton whose bottom panels are formed with tongues extending through bottom slots to lock when in folded position.

PACKAGE. A. Clemente, Philadelphia, Pa. U. S. 2,337,741, Dec. 28. In combination, a cigar, and a wrapper of moisture-proof regenerated cellulose sheet material wrapped snugly around said cigar with grain of wrapper running longitudinally of said cigar.

PACKAGE. O. H. Hultin (to Pneumatic Scale Corp., Ltd., Quincy, Mass.). U. S. 2,337,891, Dec. 28. As a new article of manufacture, a lined package, viz., a carton with lining combined.

FIBRE CONTAINER. E. E. Baker & C. C. Conway, Jr. (to Continental Can Co., Inc., New York, N. Y.). U. S. 2,338,019, Dec. 28. A container for liquid products comprising a body of fibrous material.

CROWN CAP FOR CONTAINERS. F. J. O'Brien (to Continental Can Co., Inc., New York, N. Y.). U. S. 2,338,052. A cap of the crown type for containers having a pouring mouth surrounded by a sealing surface, made of a metal shell, with a depending skirt shaped to provide holding lugs, and containing sealing gasket.

CAN CLOSING MACHINE. H. L. Minaker (to Continental Can Co., Inc., New York, N. Y.). U. S. 2,338,047, Dec. 28. A can-closing machine in which a can end closure and an open-topped filled can are adapted to be moved relative to one another in a vertical direction.

METHOD OF PACKAGING. R. T. K. Cornwell (to Sylvania Industrial Corp., Fredericksburg, Va.). U. S. 2,338,074, Dec. 28. The method of packaging comprising encasing an object in a pellicle formed of non-fibrous cellulosic material having a heat-fusible coating thereon, and then subjecting encased object to heat, causing coating to coalesce on and near the surface, causing a moisture-impervious surface over the exterior of the pellicle.

ENVELOPE. R. Mendez, New York, N. Y. U. S. 2,336,025, Dec. 7. An envelope to serve as a container for letters and, other objects, having an enclosing body portion and a sealing flap integral therewith along a folded line to seal said envelope.

CONTAINER. J. C. Bell, Brooklyn, N. Y. U. S. 2,336,158, Dec. 7. A container of paper or similar sheet material, comprising an inner sleeve having an inwardly folded bottom edge with outwardly extending groove in the inner surface of said inner sleeve.

PACKAGING METHOD. F. W. Lani-gan & T. F. Cass, Jr. (one half to Container Corp. of America, Chicago, Ill., and one half to Dewey & Almy Chemical Co., Cambridge, Mass.). U. S. 2,335,865, Dec. 7. The method of packaging a product which comprises selecting an empty paperboard container having one open end and one closed end, and a plurality of flaps on the side walls thereof adapted to be overlapped to close said open end, and coating all interior surfaces with a thermoplastic coating material to impregnate said fibreboard.

ENVELOPE AND THE LIKE. M. Al-land, Los Angeles, Calif. 2,335,470, Nov. 30. An envelope having an address face, a bottom flap, opposing side flaps, and a top flap, the bottom and side flaps having their adjacent margins, when folded, cemented together to form a pocket for letters.

DISPENSING ATTACHMENT FOR PACKAGES. R. W. Merritt, Los Angeles, Calif. 2,335,291, Nov. 30. A dispensing attachment for a commodity container, the combination of a container bottom wall having an outlet opening there through, a movable closure guided to slide substantially in the plane of the said wall and having a port therethrough of less area than the wall, that may register with the outlet opening.

PACKAGE FOR COILED PHOTOGRAPH FILM. D. H. Kinloch (to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.). 2,335,766, Nov. 30. A package comprising a coil of film, a removable floating disk member having a hub portion which co-acts with the core of said coil, and having a greater outside diameter than that of the coil of film.

VACUUM SEALING DEVICE. W. H. Exley, San Jose, Calif. 2,335,502, Nov. 30. A sealing device comprising a head having a port communication with a source of sub-atmospheric pressure, means of effecting sealing engagement of the head with a container.

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Plants and People



R. L. Sullivan



W. J. Wardell



W. C. Stolk

R. L. Sullivan has been made vice-president of the Atlantic division; **W. J. Wardell** has been named vice-president and comptroller, and **W. C. Stolk**, vice-president in charge of sales of the American Can Co., according to an announcement made recently by **D. W. Figgis**, president. All three executives have spent most of their business careers with the company.

J. H. Clark, general manager of sales of the plastics division of Monsanto Chemical Co., has been named director of sales and his former position is filled by **F. A. Abbiati**, formerly assistant general manager of sales. **J. R. Turnbull**, who has been serving as manager of development and sales promotion, has been appointed assistant general manager of sales in charge of sheet materials. **S. A. Bell** was named sales manager of the sheet department and **R. C. Evans** leaves the position of manager of the St. Louis branch to become assistant sales manager of the sheet department at Springfield, specializing in packaging materials. He is succeeded by **C. L. Richards**. **H. K. Ecklund** becomes assistant sales manager of the sheet department, specializing in fabricating articles and Opalon.

Paul D. Rollins has been appointed assistant sales manager in charge of the Central and Southern Sales Offices of The Aridor Co., Chicago. **James N. Davies** has been named Eastern district sales manager in charge of the New England, New York, New Jersey, Pennsylvania, Maryland and District of Columbia territories.

J. J. Fitzpatrick, vice-president in charge of munitions of the Armstrong Cork Co., Lancaster, Pa., has announced the war production figures for the company for 1943. Aside from its usual non-metal work Armstrong is now turning out matériel such as shells, incendiary bomb bodies, bomb racks, cartridge cases and aircraft parts.

A. G. Cloudsley, formerly assistant central district manager of the cellophane division of E. I. DuPont de Nemours & Co., Inc., has been appointed vice-president in charge of packaging sales of the Mehl Mfg. Co. The Mehl organization is a division of the Sydney-Thomas Corp., of which Mr. Cloudsley is also a vice-president.

Wm. deBack, vice-president and general manager of the Chisholm-Ryder Co., Inc., Niagara Falls, has announced the purchase of the New Way Canning Machinery Co., Hanover, Penna. It is said that with this acquisition the company now has a complete range of labelers, boxers, casers, can elevators, can feed tables, inverters and unscramblers. **Edw. A. Abend-**

schein, Jr., will manage the Hanover plant and **A. G. Moul**, **Chas. M. Hesson**, **J. J. Hesson**, **Robert Hesson** and **James Whyte** make up the administrative and sales staffs of the New Way division.

Marie Pierson has resigned from her position as assistant merchandise manager of the cosmetic and toilet goods section of Carson, Pirie, Scott & Co., Chicago department store, to become product and package stylist for Luxor, Ltd., Chicago toilet goods manufacturer.

H. A. Emmerton, plastics consultant specializing in the fields of packaging and adhesives, moulding, casting, lamination and fabrication, announces the opening of his offices at 333 Montgomery St., San Francisco, Cal.

Thomas M. Royal & Co. has moved to its Boston offices to 837 Statler Office Building.

Fleming & Sons, Inc., is celebrating its 50th anniversary this year with the publication of a souvenir booklet which tells the story of paper making.

Carl von Ehrn, formerly with Bulkley, Dunton & Co., has opened offices of his own at 50 East 42nd St., New York. He is specializing in converting, laminating and printing a vegetable parchment paper said to be made by a new process.

W. S. Richardson, general manager of the chemicals division of The B. F. Goodrich Co., has been elected vice-president of the Hycar Chemical Co. **Ross W. Thomas**, president of Hycar, announced the fact that Mr. Richardson succeeds **R. W. Albright** who resigned recently to become vice-president and general manager of Distillation Products, Inc., Rochester, N. Y. Mr. Richardson has announced the appointment of **William I. Burt** as general manager of plants; **Dr. Frank K. Schoenfeld**, director, technical and development; **Dr. Victor E. Wellman**, director of purchases, and **Harry E. Foster**, general auditor.

Geo. A. Mohlman, president; **Roe S. Clark**, vice-president, secretary and treasurer; **E. Lovell Smith**, vice-president in charge of engineering; **Tom Miller**, vice-president in charge of sales, and **Geo. C. Ferver**, vice-president and assistant to the president of the Package Machinery Co., have all been re-elected to their posts at a directors' and stockholders' meeting recently. Mr. Mohlman said, at the meeting, that postwar packaging machinery business will be at its highest level in history.

The Arvey Corp., of Jersey City, N. J., has been awarded the Army-Navy "E" for its production of airplane parts and other vital materials. In addition to metal parts the Corp.'s adhesives division also produces waterproof glues and other special adhesives for the packaging of military and naval supplies.

Lincoln B. Smith has joined the sales organization of the Hazen Paper Co., Holyoke, Mass., and will devote his efforts to the development of new products, designs, etc.

Charles H. Groff is now assistant technical director of the research laboratory of the Watson-Standard Co., of Pittsburgh, according to an announcement made recently. He comes to the company from the research department of the Crown Can Co.

Eli N. Castle, formerly president (Continued on page 224)

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224)

IT'S OUR BUSINESS



TO HELP YOUR BUSINESS



Our place in American industry is to supply closures to you who pack the foods and other products needed by our Armed Forces and civilian population. That is why it is our business to help your business in every way we can.

Our experience of more than fifty years in manufacturing metal closures has given us a vast fund of specialized knowledge. It is always at your disposal to help you solve difficult sealing problems. From this experience have grown also many improvements in closures and in manufacturing techniques which today are helping to speed production, conserve critical materials and maintain high standards of excellence under wartime conditions. In war, as in peace, Crown continues to be "sealing headquarters" for users of metal closures.

CROWN CORK & SEAL COMPANY

CLOSURE DIVISION • BALTIMORE-3, MARYLAND

WORLD'S LARGEST MAKERS OF METAL CLOSURES

CROWN CLOSURES

Crown's Wartime Policy: To supply closures, containers and services for packaging foods, beverages, chemicals, etc., needed by civilians and the armed forces. To build an ever-increasing volume of vitally needed weapons of war for our fighting men.

For Your Information



College Inn Food Products Co., Chicago, is offering whole-hearted cooperation in the nation-wide drive to save paper. One of the methods used by this company is the carton which carries a message to all retailers of College Inn products. The message stresses the importance of saving and salvaging all containers and gives instructions on how to unpack and return the cartons.

"Looking Toward Better Labels," a booklet published by the National Canners Assn., is described as "a talk with the consumer advocate of grade labeling by an advocate of descriptive labeling." It is offered as a contribution to a better understanding of the problems involved in label improvement, and of the value, to the consumer, of the labeling methods that have been proposed. It points out the advantages of descriptive labeling over grade labeling and takes into consideration all the problems involved in grading on the basis of good, better, best. Copies are available from the Washington office.

"The Conversion of Jennie James," a playlet offered to women's clubs and organizations, explains, in a pleasant way, the basis of U. S. Grade labeling. Copies may be obtained from U. S. Inspected Foods Educational Service, New York City.

The recently organized Food Forum, sponsored by a group of small food companies, will meet at a dinner in Washington on March 16, to discuss the problem of food for war relief. The nature of European needs, the supply situation, new processing techniques, and research data analyzing the efficiency of various relief diets will be some of the subjects under discussion. Subsequent meetings will take up in more detail the scientific material involved.

The fifth annual meeting of the Institute of Food Technologists will take place in Chicago, May 29, 30 and 31. The program will include addresses and the presentation of technical papers by authoritative speakers on topics of great moment in the food world.

The National Assn. of Mfgs. recently released two of a series of five booklets which are to act as guides to postwar preparation. The first booklet, entitled "Guide to Internal Organization for Corporation Postwar Planning," is a summary of the experiences of more than 350 representative manufacturing companies and suggests a step-by-step program of action. The second, entitled "Guide to Postwar Sales Planning," attacks such problems as the building or rebuilding of a distributor organiza-

tion, the building of a sales story about a wholly new product and the hiring and training of a new sales staff. The remaining three publications will appear under the titles "Guide to Postwar Product Development," "Guide to Cost Study in Corporation Postwar Planning," and "Guide to Postwar Corporate Financial Planning."

A meeting was held recently in Chicago to organize the National Mustard Mfgs. Assn., and a large percentage of the industry was present. The officers elected were: Carl M. Plochman, president; Paul L. Dorn, secretary-treasurer; Leo Binzak, H. A. Tuttle, J. Heichelbach, Micheal Kredovich and C. G. Russell, directors.

Among the more important emergency problems considered in the 62nd annual report of the State Experiment Station, Geneva, N. Y., are the packaging and storage of processed foods, particularly dehydrated foods, and the preservation of fruits and vegetables and fruit and vegetable juices. Copies of the report are available upon request to the Station.

Color belongs to everyone and no one can obtain a monopoly in its use for any particular purpose, ruled the Georgia Supreme Court recently. The court dissolved an injunction granted by a lower court to restrain the Seybold Baking Co. from using a brownish yellow paper to wrap brown bread similar to the paper used by the Derst Baking Co. for its brown bread.

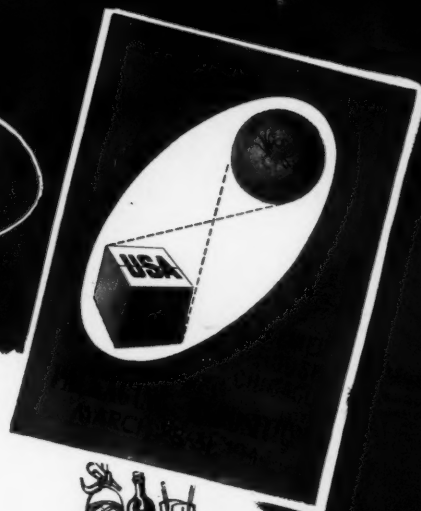
The nationwide bottle roundup, sponsored by Owens-Illinois Glass Co., last year is being repeated again this year. In announcing the campaign J. P. Levis, president of the company said: "Because the demand for bottles and other glass containers for our fighters has increased so sharply, the cooperation of



every householder is needed in hastening the return of deposit bottles. . . . Millions of bottles are going overseas to our armed forces. These do not come back." Hollywood is cooperating in the drive. Two featured film players, Marjorie Hoshelle and Marianne O'Brien, shown here, gathered more than 5,000 empties in North Hollywood during a two-week period.

A committee made up of Latin American students studying in this country has been formed under the sponsorship of the international printing ink division of Interchemical Corp., for the purpose of advising the contest com- (Continued on page 224)

Welcomes the **PACKAGING EXPOSITION**



**MANHATTAN
PASTE & GLUE
CO., INC.**



Year after year this important exposition of packaging materials and supplies performs a valued service to the packaging requirements of our great nation. We, at Manhattan, always look forward to keeping this date . . . for it gives us the opportunity to bring our technical and service staffs together with yours. In that way, we are all available and on hand . . . ready to discuss your adhesive problems . . . and ready to offer our suggestions for their solution. Your visit, therefore, to our Exposition Booth No. 10, as well as to our Suite at the Palmer House is cordially invited.



MANHATTAN PASTE & GLUE CO., INC.

Lion Brand Adhesives

Chicago
Philadelphia
Rochester
Boston
Columbus, O.

425 GREENPOINT AVENUE, BROOKLYN, N. Y.

Packaging exposition and conference

Tentative program plans and list of exhibitors for the Fourteenth Annual Packaging Show sponsored by American Management Assn. to be held March 28 to 31 at the Palmer House, Chicago.

TUESDAY MORNING

Significant Trends in Package Merchandising
Electronics—New Magic in Packaging
The Future of Processed Foods

TUESDAY AFTERNOON

Packaging for the Armed Forces

Round-table with Army, Navy and WPB participating. Objective discussion for suggestions on improvements and refinements in existing specifications in the light of one year's experience. It is hoped to have the moving pictures which the Government has taken of operations in both the Far East and in the Mediterranean area.

WEDNESDAY MORNING

What Users Want and Need in Postwar Packaging Machinery
The Organization and Operation of a Package Development Department
Bulk Sales Versus Packaged Products

Concurrently with the above will be a second session devoted to shipping topics as follows:

Latest Developments in Wooden Containers
The Implications of Proposed Changes in Rule 41
Practical Application of Resin Adhesives

WEDNESDAY AFTERNOON

What's Ahead on Critical Materials?

Panel discussion by Government representatives and men from industry. It will cover paper, glass, plastics, metals, fabrics and other materials.

THURSDAY MORNING

Success stories, probably six, dealing with container re-use and paper conservation. Emphasis will be on "How It was Done" instead of "How to Do It."

THURSDAY AFTERNOON

Technical Session

Conducted by Charles A. Southwick, Jr., Shellmar Products Co., and technical editor of MODERN PACKAGING; Frederick S. Leinbach, Riegel Paper Corp.; W. H. Graebner, Menasha Products Co.; also a representative from one of the can companies.

This will include the reading of several papers, the final report on the Packaging Institute testing manual, plus informal technical discussion on moisture-vaporproofing problems.

GUIDE TO EXHIBITS*

ACME STEEL CO.

BOOTH 4

ALUMINUM CO. OF AMERICA

BOOTHS 403-404

The Aluminum Co. exhibit will feature three major aluminum packaging items, namely: foil, collapsible tubes and seals for glass containers. In the foil section heat-sealed foil packages will actually be manufactured and equipment for testing those packages will be available to show the possibilities in actual service conditions. In the section devoted to Alseco Seals the company will show the wide variety of seals available and also the wide use of those seals. A demonstration of the sealing of penicillin packages will be carried out with the actual machinery used for this purpose. The collapsible tube section will show some rather interesting packaging possibilities which will be available after the war. Also shown will be aluminum containers for bulk shipment.

AMERICAN PHOTOCOPY EQUIPMENT CO.

BOOTH 802

This company will display A-PE-CO Photo-Copy Equipment in actual operation. Visitors may bring any material they wish, such as letters, blueprints, records, worksheets, photographs, forms of various sorts, etc., and copies will be made for them in order to demonstrate the accuracy, speed and ease of operation of the A-PE-CO Photo-Copyer.

ANCHOR HOCKING GLASS CORP.

BOOTHS 509-10-11

Display of approved glass tumblers, jars and bottles for packing purposes; metal and plastic caps for sealing glass-packed products; home canning jars and caps; oven-glass; tableware.

THE ARABOL MANUFACTURING CO.

BOOTH 301

Adhesives for wartime packaging, shipping and labeling.

ARMSTRONG CORK CO.

BOOTH 8

ARVEY CORP.

BOOTHS 518-519

Shadow-box background of plastic table, settees and chairs.

BARRETT-CRAVENS CO.

BOOTH 512

Exhibit featuring large map showing national distribution plus revolving wheel showing entire line of products. Equipment: hand lift-truck, electric lift-truck and skids.

BETTER PACKAGES, INC.

BOOTHS 527 and 528

BURGESS CO.

BOOTH 412

CELANESE CELLULOID CORP.

BOOTHS 501-2

What Lumarith plastics are doing for wartime packaging and what they can contribute to peacetime packaging will be graphically displayed at the Celanese Celluloid Corporation exhibit. Ideas for utilizing the several types of Lumarith plastics and their many forms in postwar packages, some of these based on designs now current, will be presented, thus keeping conversion costs and equipment down to the absolute minimum. Celanese Celluloid Corp.'s products for packaging now include Lumarith E. C., based on ethyl cellulose, Lumarith V. N., a vinyl acetate vinyl-chloride copolymer foil as well as Lumarith cellulose acetate, which was an important factor in prewar packaging and is now largely devoted to war applications as well as wartime packages.

CENTRAL STATES PAPER & BAG CO.,

BOOTH 517

War movie showing how merchandise is packed, various box liners and war packaging, transparent acetate boxes.

* Including all information available before going to press.

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MODEL S
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THE NEW WORLD AUTOMATIC
UNI-TURRET LABELER



WORLD
AUTOMATIC
ROTARY
LABELER

DEPENDABLE • EFFICIENT • STURDY • ECONOMICAL



The Model HG
WORLD Automatic
Straightaway Labeler

For Gallon and Half-Gallon Jugs or Bottles—
Round, Square or Odd Shaped

The Model HG WORLD Labeler has all of the exclusive design and construction advantages that have made World Straightaway Labelers standard equipment in most modern production requirements. The world over it incorporates new engineering features that make it a smooth, efficient and dependable for labeling large heavy containers or the Straightaway for smaller containers. Fully automatic, it maintains a steady constant production of jugs to bottles from 2 1/2 to 10 inches across and up to 18 inches in height. The novel production rate by galvanized containers is twice per minute.

The Model HG WORLD Labeler has a new straightaway line feed mechanism that automatically and accurately positions the container ahead of the labeling operation and maintains their position right through the complete labeling process. Labels are pre-tensioned in correct relationship to the jug. Positive timing and spacing of the line to jug head. Positive timing and spacing of the line to jug head. Positive timing and spacing of the line to jug head.

NOW IS THE TIME TO DECIDE

WHAT IN THE

World

YOU WANT!

- Whether your labeling requirements involve ink or iodine, catsup or cosmetics, liquors or lotions—whether it's continuous mass production you're after, limited output, frequent changes of container or label sizes and shapes, precise application of front labels, back labels, neck labels—or what have you—you will find the most efficient, economical labeling in the WORLD.

Tell us what you have in mind for the future and we'll see that you get all the information you need to plan wisely and well.

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labeling Machinery

Worcester, Massachusetts

NEW YORK	PHILADELPHIA	PITTSBURGH	CHICAGO	SAN FRANCISCO	DENVER	LOUISVILLE
DALY LAKE CITY	EL PASO	SEATTLE	PORTLAND	LONDON	MONTREAL	TORONTO
WINNIPEG	SPokane	VANCOUVER	SYDNEY, AUSTRALIA	WELLINGTON, N. Z.	SAN JUAN, P. R.	

CLEVELAND CONTAINER CO. BOOTH 408

CONSOLIDATED PACKAGING MACHINERY CORP. BOOTH 532

Lounge space only

CONTAINER CORP. OF AMERICA BOOTH 514-15-16

Exhibit will consist of a showing of corrugated and solid fibre shipping cases and folding cartons with considerable emphasis placed on such of these materials as are devoted to the war effort.

CONTAINER EQUIPMENT CORP. BOOTH 5-6

The exhibit that this company is planning will be in keeping with the times and the general theme of wartime packaging. Featured will be one of the standard carton glue sealing machines of the same type used extensively throughout the nation for emergency Army ration packaging. Also pictured will be the company's facilities as a link in the vital responsibilities of the homefront duties to the Armed forces and urgent civilian requirements.

CUNEO PRESS, INC. BOOTH 818

THE DAVISON CHEMICAL CORP. BOOTH 530-531

Dehydrated (Method II) Davison type of packaging with the use of silica gel as it applies to present, and postwar packaging.

DEXTER FOLDER CO. BOOTH 819

1 Bliss Model J. C. Stitcher, 1 Latham Model 34B, 1 Boston Model 23.

DIAGRAPH-BRADLEY STENCIL MACHINE CORP. BOOTH 9

THE DOBECKMUN CO. BOOTH 406-407

THE DOW CHEMICAL CO. BOOTH 816

E. I. DU PONT DE NEMOURS & CO., INC. BOOTH 201-202

The exhibit will consist of two parts: a review of Cellophane's chief uses in the war effort; in addition a postwar section will feature basic trends which may be expected to influence postwar packaging.

EASTMAN KODAK CO. BOOTH 405

ECONOMIC MACHINERY CO. BOOTH 522

J. L. FERGUSON CO. BOOTH 410

FLOQUIL PRODUCTS, INC. BOOTH 804

FOOD INDUSTRIES BOOTH 507

GAYLORD CONTAINER CORP. BOOTH 602

Display will consist largely of specially designed packages for packing and shipping war supplies and essential items for home consumption.

GENERAL BOX CO. BOOTH 308-309

Wirebound wood boxes and crates containing various wartime and peacetime products. Combination wood and fibreboard containers. Patented Generalite factory tote boxes and beverage boxes, and corrugated shipping containers of special design.

A. J. GERRARD AND CO. BOOTH 814

The showing and demonstrating of Stur-D-Strap, new laminated fibre steel strapping substitute. Display of Steelbinder and Bulk binder strapping tools, as well as steel strapping and accessories.

THE GOODYEAR TIRE & RUBBER CO., INC. BOOTH 102-103-104

Mainly postwar resources and materials, and a glimpse of what may be expected from Pliofilm come Victory.

HAYSSEN MANUFACTURING CO. BOOTH 302

THE HINDE & DAUCH PAPER CO. BOOTH 203-204

The Hinde & Dauch display will consist of war materials packaging exclusively. V3c and Vls overseas weatherproof boxes will be featured. Samples of these boxes in which to pack food products, medical supplies, oil, paint and varnish, germicides and many other items will be exhibited. There will also be on display a group of domestic boxes designed for shipping arc welding rods, airplane parts, uniforms, shoes, helmets, goggles, chemicals, fabrics and many other products.

INTERNATIONAL PRINTING INK DIVISION OF INTERCHEMICAL CORP. BOOTH 310

JIFFY MANUFACTURING CO. BOOTH 526

An unveiling will be made at the Packaging Show of a new economy package, incorporating for the first time a general purpose folding box with cushioning and insulating filler. A new liquor package and furniture pack will also be shown.

KALAMAZOO VEGETABLE PARCHMENT CO. BOOTH 2

Parchment, bond, waxed, greaseproof and laminated papers.

PAUL L. KARSTROM CO. BOOTH 822

KIMBERLY-CLARK CORP. BOOTH 601

Display (both photographic and actual) of packages of war products protected by interior packing of Kimpak Creped Wadding. Of special significance will be actual samples illustrating use of the new Kimpak Wrapped Pads and their application step by step as prescribed in newly issued Air Force Specifications for packaging of precision instruments (gyro) and small parts for overseas.

MANHATTAN PASTE & GLUE CO., INC. BOOTH 10

Display will consist of a reproduction of company home office and factory—a building constructed of wood and metal, illuminated, for the center of the booth. On each side of the building will be a turntable with three shelves, where packages of many descriptions will be displayed. Many of the packages will consist of those being used in the war. Also wartime products.

MARSH STENCIL MACHINE CO. BOOTH 508

Marsh stencil machines, inks, fountain brushes and other Marsh marking supplies.

THE MENASHA PRODUCTS CO. BOOTH 411

A display of packages and papers developed by and produced by The Menasha Products Co. for protective packaging of foods. Included will be packaging for the bakery, dairy, frozen food, dehydrated food, cereal and milling, confectionery, meat packing and miscellaneous food industries.

MILLER WRAPPING AND SEALING MACHINE CO. BOOTH 523-524-525

MILPRINT, INC. BOOTH 503-504-505

MINNESOTA MINING & MFG., CO. BOOTH 820

MODERN PACKAGING BOOTH 109-110

News ticker service in the background of booth. Divan, chairs and table for guests.

NASHUA GUMMED AND COATED PAPER CO. BOOTH 821

AN AMERICAN INSTITUTION WORKING WITH AND FOR AMERICA



PAPER HIGHWAY TO WAR FRONTS

Paper, first as a finished product, then in a multiplicity of converted forms for hundreds of war uses, extends from America's mills to every destination of our fighting forces. Highly specialized types of paper are requisite for conserving Fighting Foods and Fighting Materiel . . . wrappings, bags and carton liners for foods, greaseproof wrappings for ordnance items, protective paper for plane, tank and trac-

tor parts, papers to safeguard medical supplies, ammunition and guns, various types of paper essential for almost unlimited applications at home and on battle fronts abroad.

Up in the heart of America's woodlands, "Big Swede," world's largest glassine paper machine, working hand-in-glove with companion machines, strives mightily, continuously and effectively to process into these war-essential papers the pulpwood harvest from Rhinelander's extensive timberlands. Our peacetime experience of almost a half century, the skill and efforts of our entire personnel, all the resources of our organization are enlisted today in producing the protective papers which as a unit in America's "task force" will aid in bringing about a speedier Victory.

BACK THE ATTACK—WITH WAR BONDS

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD



Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers

Cereal Wrapping Papers
Laminated Greaseproof Papers
Lard and Shortening Liners

Bakery Product Wraps
Cracker Box Liners
Greaseproof Innerwraps

Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

MARCH • 1944

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NATIONAL METAL EDGE BOX CO. BOOTH 513
Displayed will be the necessary equipment as well as results of the Improved Metal Edge Method of Packaging, Material Handling and Inventory Control, both in connection with the war effort and the postwar period.

NATIONAL ADHESIVES BOOTH 1
Division of National Starch Products, Inc.

NATIONAL WOODEN BOX ASSN. BOOTH 7
Moving picture set-up showing manufacture and varied uses of nailed wooden boxes, together with graphic display of the indispensibility of the wooden box in war shipping and postwar uses.

NEW JERSEY MACHINE CORP. BOOTHS 205-206
A display of representative packages labelled on the Company's equipment. A model 86M "Pony Labelrite" and a model 1337 Table Gummer will be in operation. A "Motoair" pump will be displayed also.

OWENS-ILLINOIS GLASS CO. BOOTH 101
The Owens-Illinois display which will feature the use of Insulux Glass Block in its construction will show Owens-Illinois packages that are used directly in the war effort. In addition to the war aspect of the display, packages as used for food, dairy products, pharmaceutical and proprietaries, beverages and liquor will be shown. How Insulux Glass Block can be used in packing establishments will be featured.

PACKAGE MACHINERY CO. BOOTH 207-208
DF machine for wrapping a wide variation of shapes and sizes of candy bars in all types of wrapping materials, including lining.

PACKAGING PARADE BOOTH 401
PARAD-E-GRAMS posted on Parade Booth bulletin board, highlighting exposition and conference news and daily packaging news from everywhere. Candid camera "shots" of exposition floor personalities taken "on the spot" by Packaging Parade photographer.

PACK-RITE MACHINES BOOTH 809

PAISLEY PRODUCTS, INC. BOOTH 801

THE PERMUTIT CO. BOOTH 824
Display will consist of a presentation of the Number II method of packaging with silica gel for the armed forces.

PETERS MACHINERY CO. BOOTH 306

THE PILLIOD CABINET CO. BOOTH 529
Fancy wooden boxes for merchandising purposes.

PNEUMATIC SCALE CORP. LTD. BOOTH 311
Display will consist of actual samples of wartime packages being produced on Pneumatic packaging and bottling machinery.

POTDEVIN MACHINE CO. BOOTH 823

W. RALSTON & CO., INC. BOOTH 808

RAPINWAX PAPER CO. BOOTH 813

F. B. REDINGTON CO. BOOTH 111
Display of packages produced on machines. Literature will be available.

REYNOLDS METALS CO. BOOTHS 303-304

RIEGEL PAPER CORP. BOOTHS 209-210

A. H. ROSS & CO. BOOTH 811

THOMAS M. ROYAL & CO. BOOTH 307
General exhibit of flexible containers, principally for military purposes.

THE SEALRIGHT CO., INC. BOOTH 409

SEFTON FIBRE CAN CO. BOOTHS 514-515-516

SHELLMAR PRODUCTS CO. BOOTHS 105-106
Packaging of war materials and essential civilian products.

SHERMAN PAPER PRODUCTS CORP. BOOTHS 107-108
Wrapping demonstrations with protective papers illustrating Ordnance Methods I and IA and cushioning protection methods. The papers used in these demonstrations will include the Sherman V-LINE, which covers greaseproof anti-corrosive papers in Types I, II and III, and in Grades A and C. Demonstrations will also include the wartime uses of Corroflex, the flexible cushion packing material available in three protective types, including greaseproof and waterproof protection

SHIPPING MANAGEMENT BOOTH 3

THE SIMONIZ CO. BOOTH 812
Two small electrically heated dipping pots; three display boards showing typical applications of rust-preventive compounds and wax sealers. Samples of all products as well as various spare parts treated with compounds. Sample packages dipped in wax sealer.

STANDARD KNAPP CORP. BOOTH 805

STEIN, HALL MFG. CO. BOOTH 803
Company will play up the V-3-C paste formula in waterproof boxes as well as other adhesives which tie in with the war. Samples of products in which these are used will be exhibited.

STOKES & SMITH CO. BOOTH 305
Packages and containers handled on Stokes & Smith filling, packaging and wrapping machines with special emphasis on Army, Navy and Lend-Lease work.

SYLVANIA INDUSTRIAL CORP. BOOTH 817

TRIANGLE PACKAGE MACHINERY CO. BOOTH 211
Will exhibit Elec-Tri-Pak Vibratory Feed Weigher for weighing and filling into cartons or bags cut macaroni, candies, nut meats, cookies, etc. Also exhibited will be a Volumetric Filler with plunger for accurate measuring and filling of dry materials such as jelly powder, chocolate pudding and similar products. Also the latest model Automatic Auger Packer for filling powders in small containers will be shown.

UNION BAG & PAPER CORP. BOOTHS 520 and 521
A miscellaneous display of paper bags specially designed for foods and other vital war needs.

UNITED STATES AUTOMATIC BOX MACHINERY CO., INC. BOOTH 815
Model GE Scott net weighing machine in actual operation.

WILLIAMSON ADHESIVES, INC. BOOTH 402
Exhibit of packages sealed with Williamson Adhesives and an exhibit of liquid adhesives.

WIREBOUND BOX MFGRS. ASSN. BOOTH 806-807

ADVERTISING IN

Action

The General Electric Company, and other large national advertisers, are applying their advertising and merchandising facilities to furthering the war effort. Our 82 years' experience serving American industry, and our Government, enables us to key such effort to essential wartime activities and postwar reconversion problems.



WINDOW DISPLAY

FORBES



LITHOGRAPH CO.

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Changing ways of living

(Continued from page 89) lighting, synthetic rubber, plastics, alloys and other radically new developments are not things to be afraid of, but things to be welcomed.

Older people, unfamiliar with the host of new products developed during the war period, will be reluctant to accept changes. The younger people won't hesitate. They'll have courage to try the new. This contrast between young people on the one hand, and the older people on the other hand, should affect the consuming market, not only for products and services, but also for packages.

Fewer Men: Even before the war, men were numerically growing less important in our population. In 1910, men held a slim 2,800,000 majority over the women. But by 1940, adult women outnumbered adult men by 1,360,000. In the 1942 elections, for the first time in our history, more women voted than did men. War, with its casualties, will still further accentuate the declining importance of the male sex.

More Important Women: Before the war, women were said to buy 85 per cent of all consumer goods. Whatever the percentage was, it's bound to be higher when the war is over, not so much because of the numerical superiority of women, but because of their increased importance.

One out of every three women is in the nation's labor force—17 to 18 million women in all. These women, many for the first time, have money—money of their own. A study made by *McCall's* magazine among women factory workers in Detroit disclosed that while their average weekly wages before the war were only \$26, their average wartime wages amounted to \$53. Almost 40% of these women said they wanted to stay in jobs after the war and continue to earn money.

The fact that women are in men's jobs today is not so important. In many cases, women will give up their jobs to men when the war is over. The important thing about women in this war is their *increased knowledge*. Now they know men's jobs. They know manufacturing processes. They know quality. They know how things are made.

Even women who have not gone into war jobs, but who've stayed at home, have increased knowledge, because of the war. These housewives know quality, too. They've had to repair, mend and "make do" many of their personal and household possessions. Shopping is a task, in wartime, that's sharpened women's critical faculties. They've had increased housework, such as home canning.

While women have always been the buyers of most consumer goods, the new knowledge, the new money and the importance they've acquired, as a result of the war, will make them an even more powerful influence in the postwar years, with a greater effect on how merchandise is made, distributed, advertised and packaged.

It is too early to make any predictions as to women's postwar attitude toward grade-labeling and descriptive, informative labeling on packages. It is safe to predict, however, that women will not resent being given as much helpful, informative material as possible on or in the packages which they buy. Women have passed from the known and familiar products of prewar days to the alternates, substitutes and modified products of wartime. They know that the postwar period will bring more changes. They don't know whether manufacturers will return to prewar products when the war is over or change and improve these products. Hence full directions and information are advisable in packaging.

Marital Status: Because women will outnumber men when the war is over, competition for husbands will be keener.

Getting, and holding her man, will be of more concern to a woman. As a result, she'll be in the market for more products to enhance her charm—more packaged products. As a result, too, there will be more women doing a combination job—working in a store, office or factory and at the same time, maintaining homes of their own. These women, in their homemaking activities, will need more and more to rely on packaged products that will save time and labor.

New Consumer Awareness: Not only women, but men consumers also, as a result of the war, have become more package conscious. Just as a woman, in buying talcum powder, became package conscious when the powder was handed to her in a cardboard, wartime substitute, so a man is made package conscious when he buys his wartime package of tobacco. Both women and men, because of the war, will have increased knowledge of manufacturing processes and materials. They will have seen, either in the armed forces or in their work in war plants, the uses to which plastics, metals, alloys, paper, fabrics and other materials employed in packaging can be put.

Consumer Income: No one, at this time knows what consumer income will be in the postwar years. But one thing we do know: wars cut down the number of the well-to-do and raise millions of the poor into the ranks of the middle-income group. This process, which has been repeated in this current war, has been of benefit to the makers of packaged goods.

New Consumers for Packaged Goods: Many of the poorer families in the United States, before the war, had the notion that bulk merchandise was cheaper than packaged products. With the added income from wartime jobs, these families—in many cases for the first time—have been willing to buy standard, branded, packaged goods. The habit of buying packaged goods will probably persist, since it will be evident to these new consumers that packaged products in the standard, branded class are actually more economical.

This condition is not limited to civilians in our population. It also applies to the men and women who are in the armed forces. Coming from all sections of the nation, these men and women have been introduced through General Issue material or Post Exchanges to products with which they were unfamiliar before they entered the services. Many of these wartime habits will persist, after the war.

All in all, consumer conditions which the packaging specialist will have to consider in planning for postwar merchandise spell a definite opportunity. The war has accelerated consumers' desire for a higher standard of living—an American standard of living, which always has been above those of other nations. More and better packages flourish as standards of living are raised.

Postwar design "in work"

(Continued from page 107) unnecessary expense of over-packaging is not justified. Conversely, the talent of a designer may be lavished on an exterior carton which, at the point of use, would be thrown away and an inferior inside container revealed. In this case, the customer may think twice before being taken in by the glamorous outer face of the product on his storekeeper's shelves.

Simply because the wartime customer has had to buy packages with a minimum of appeal does not mean that he likes them always. There are exceptions; in some few cases a war-baby has proved itself far superior to its peacetime predecessor, and will remain on the market in peacetime. Postwar packages are going to be designed to satisfy the

The Reins



... which control
the output of many paper
manufacturers, coaters and converters

are in the hands of

Williams

This central coordinator of activity is the source of supply
for the widest variety of packaging papers.

If you are interested in packaging, either now or post-war,
it may be a good idea to talk to the driver.

CHARLES W. WILLIAMS & CO., Inc.

A U T H O R I T I E S O N B O X C O V E R I N G P A P E R S

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NEW YORK 12, N. Y.

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167 OLIVER STREET
BOSTON 7, MASS.

aesthetic sense as never before, but within the bounds of good taste. The use of color is pertinent in any discussion of appeal. There is a trend towards the use of more subtle color, now that strong colors have begun to scream at one another from too many counters and shelves. Particularly in the cosmetic and semi-cosmetic field, it is doubtful whether the package that "sells" in orange and black will suit the color scheme in the home. On the shelf, too, a quiet color scheme among many strong combinations of color will be conspicuous by contrast, and therefore, a definite selling advantage may be established. Another advertising "must"—legibility—can be satisfied without sacrificing everything to it. There has been a tendency to over-emphasize the legibility of a trade name; it is up to the designer to determine where reasonable legibility ends and strident advertising begins.

I believe that the retail customer is going to be sensitive to beauty in packages as a direct reaction to war packaging. He will be a sophisticate in so far as minimum packaging is concerned also. It is doubtful that he can ever be fooled into thinking that packaging must add appreciably to the cost of his product. After all, he has accepted the wartime package with no reduction in the retail price in most cases, and he knows that, even allowing for fluctuating economic conditions, he can demand excellent design and efficient packaging without being taxed heavily for these.

From a period when the designer was called upon to make bricks without straws, he now progresses to a period when all things are imminently available. The best check upon him, if he needs one, will be the consumer, and without the opportunity now for consumer test the designer must predict, as best he may, what will be acceptable and popular. As in other fields, there are as many guesses about public acceptance and expectancy as there are manufacturers—more, if the arm-chair theorists are to be included. With so many opinions about "what the public wants" the designer must steer a sober course in the work he is doing now. If, however, the lessons that war has taught are added to basic design principles, there is reason to hope that packaging will show as much advancement as in any comparable period of normal peacetime development if not more.

Package testing marketwise

(Continued from page 105) any type of general market research problem as well as the specialized ones of package design research, though it could not possibly cover full scale research studies.

Buying a professional package design study

When a major problem is known or suspected to exist which might be solved through research, a field study is indicated. After preliminary studies and checking for previous data on similar problems, it can be determined whether a small-scale study or a full-scale regional or national survey is necessary. It may develop that the problem can best be handled through the use of some of the specialized research techniques such as consumer jury, test store audits or consumer panels.

Having determined that the problem requires professional research agency assistance, two or more such agencies should be called in for discussion of the problem, paid a flat fee for consultation and for making their recommendations as to methods, procedures, questionnaire forms, etc. When full specifications for the study have been drawn up, bids should be asked for, and such bids should be based on an assumed average production rate with the cost being increased or de-

creased in the event that the actual survey should have a lower or higher production rate when extended to a national basis. Such bidding is eminently fair both to the manufacturer and to the research agency, when the basis is uniformly understood by all concerned.

Important to look for in a research agency are a research director experienced in previous studies of the type required on your problem, a permanent staff of field supervisors in major markets, salaried staff of interviewers, permanent staff of coders and editors, staff and facilities for manual and mechanical (punched card) tabulating, and one or more highly trained mathematical statisticians.

Having selected the research agency, there should be a full discussion of the projected form of the final report and of the methods of applying potential findings. Dummy tables and charts should be prepared to avoid opportunities for misunderstandings, to force all of the decisions that are better made before than after the field work and tabulation have started. Every table and chart is set up except for the final figures to be inserted when the field work is completed.

Necessarily, much of the discussion of research on package design applies as well to product testing and to consumer research in general. It is my suggestion, therefore, that if your company is not at present so equipped, you should now make plans for the addition of a basic consumer research staff so that, both during the war period and for the postwar, you may take full advantage of research as a substitute for guesswork in all problems affecting the marketing and packaging of consumer goods.

Future trends in distribution

(Continued from page 103) lemons, while many other products have been subjected to experimentation. In many instances the dehydrated product is of a different character than the original. When these products are made available for general consumption after the war, consumers will have to be informed about their characteristics and their uses. The rapidity with which these products gain public acceptance will depend partly upon advertising and partly upon the ingenuity of package designers.

In almost all discussions of postwar developments much is said about expansion of air transportation, both for passengers and for commodities. With time and distance compressed by rapid air communications, producers and distributors of many kinds of products will need to adjust their marketing plans. Perishable goods will move faster. Marketing areas will be expanded. Retailers may be able to carry smaller stocks. Thus, the opportunities for postwar transportation by air hold a challenge to producers to develop packaging which will be in harmony with air mail and air express requirements. New light-weight metals and plastics may supply the need.

The 135,000,000 Americans who constitute the consumer market of this country will be eager buyers of the postwar products of America's farms and factories. They have the desire and most of them will have the means for carrying out their desires. Every legitimate device for making it easy for consumers to buy goods needs to be developed if the total sales volume is to reach the stupendous figures indicated earlier. To manufacturers and distributors the postwar opportunities for making and selling goods are limitless. If the goals which lie ahead are to be attained, the best skills and practices in packaging must be brought into play.

for MAXIMUM PROTECTION



... In Guarding the Fliers of America's Fighting Aircraft

The list of Breeze products reads like an aircraft assembly line. Each product is doing its part in guarding America's fighting aircraft. Breeze Aircraft Armor Plate, manufactured by the famous Breeze electro furnace process, is engineered to unusual shapes and sizes to meet designers' special requirements. Breeze multiple circuit electrical connectors, those tiny couplings which carry from two to forty-two circuits bring the life giving impulses to and from the vital parts of the plane. Other Breeze products including radio ignition and auxiliary shielding, Shielding Conduit and Fittings, Conduit Junction Boxes, Cart-ridge Engine Starters, Propeller Pitch Controls, Remote Control Drives, Electrical Filters, etc. are all doing their part in the battle of protection.

BREEZE CORPORATIONS, INC.

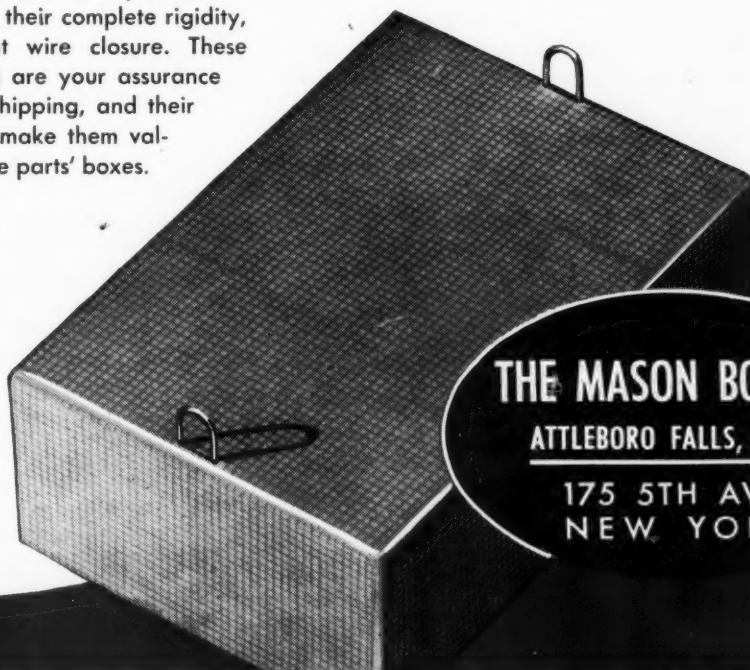


NEWARK, N. J.

For Maximum Protection

... In Vital Shipping Throughout Industry

Mason MAILMASTERS are important for their ease of mailing, their complete rigidity, and their convenient wire closure. These engineered packages are your assurance of better and safer shipping, and their outstanding features make them valuable as assembly line parts' boxes.



THE MASON BOX CO.

ATTLEBORO FALLS, MASS.

175 5TH AVE.
NEW YORK

Tomorrow's prospects

(Continued from page 101) to show what the packager is up against in the hot, humid climate of India. They apply as well to any locality where climatic conditions are a serious hazard to the package. They were written by Nixon Bewsher, a chemical engineer, while supervising the erection of a new processing plant in India:

"One day this week I went into a chemist's shop here to purchase a tube of shaving cream and when I opened the package, the shaving cream was there all right, all dried up in a solid mass, but the metal tube had been practically entirely eaten away by some corrosive actions. I saw the same thing in Karachi a few days ago. As I passed a warehouse door I saw a man shoveling a whole heap of these corroded metal tubes into boxes apparently for disposal on the rubbish heap. In the latter case they looked like toothpaste tubes, but whatever they were, they had been unable to stay the distance and were useless for sale. . . .

"It must be realized at the outset that India is hot, very hot, and in some parts, it is hot all the year round. Thus any slight reaction between the metal tube and its contents, which, in the comparative cool of the English or European climate would be unnoticed, becomes an aggressive corrosion in this constant heat, especially after it has had a good start off in, say, that well-known inferno, the Red Sea, and so, in a short time, corrosion becomes obvious and the sales value of what may be a most attractive pack is entirely removed.

"In some parts the climate is extremely moist and damp with the result that the most perfect packing is necessary to prevent moisture from finding its way into the packs and spoiling the contents. Health salts, for instance, are difficult to store for lengthy periods and often I have bought tins and bottles, both of which have degenerated through seepage of moisture through the cork or tin cover. . . .

"Another point which should be carefully considered is that goods are kept on the shelves here much longer than in more industrialized countries. This is especially true of rural districts where customers for higher priced goods are comparatively few. . . . Distances are great and facilities for handling are non-existent or of a remarkably crude variety. Thus great difficulties are experienced in getting supplies to the shops and to obviate this as much as possible the shopkeepers tend to make large purchases so they can organize themselves to make the shipment in one convoy, so to speak, and in this way to minimize loss and expense. I have noticed this tendency to overstock all over India.

"Certain kinds of paper are much sought after by ants, but this does not appear to be a really serious matter and it may be due to the paper having been impregnated with certain varieties of fat, wax or oil which these insects like. I have seen paper eaten on many occasions, but not in a large way. It is a point, however, which might be kept in mind when vegetable and animal impregnated papers are proposed. . . ."

The great enigma in the foreign trade picture is Russia. Some are of the opinion that Russia will be a big market for American goods. Others believe she will be a competitor making a wide bid for world trade because of the industrial empire she is reputed to have built up in the Urals. Unquestionably she will need heavy industrial equipment from the outside to build up her devastated cities and farms, her power plants and her railroads. It must be remembered, however, that in doing business with the Russians means doing business with the group who control the master plan essential

only to the Soviet scheme of things and not doing business for what the individual Russian consumer or regional group may want to buy from the outside. Should the Soviet scheme include the development of international trade as essential to its industrial future, this competition might be formidable in many parts of the world.

A new phase of international commerce that will affect actual packaging specifications more than any other will be the establishment of the fast air cargo liner service to every part of the world. The most important factor in these shipments will be lightweight containers and protective packing to save shipping costs of this express service. Much study has already been given to this problem. Container manufacturers and airlines are at work on the preparation of standardized specifications for such shipments. Not only will improved lightweight corrugated containers enter into this picture, but the new lightweight protective films and laminations, plywood and other lightweight materials developed during the war will have a big place in future international air transport.

Never in our history has American industry had the prestige and acceptance it now holds throughout the world. This country has been mercifully spared the devastation that has wrecked the whole of Europe. When the war is over, we will be ready to go ahead with our production and merchandising while Europe will have to rebuild and regain everything she has lost. This situation should not be regarded complacently. Now is the time to make plans for a head start. Conquered countries, after a war, sometimes have the advantage over the victorious in that they can afford to make greater concessions. Germany after the last war had an advantage because she was able to barter her manufactured goods for raw materials. Her business men were eager, too, to go anywhere in the world, live in the farthest outposts, learn native tongues, if by so doing it meant new markets for German goods.

To the British, world-wide policy and empire are a tradition. They have not neglected world trade because there is a war. Their salesmen are all over the world, even in this country, making postwar plans.

The United States has more than a selfish interest in wanting her share of world trade. This wider interest is a responsibility of a world power. The way it is conducted, the ethics used in promoting it can foster or destroy the peace of tomorrow. American manufacturers should do everything they can to forestall the kind of criticism, whether unwarranted or deserved, recently directed at exporters by Mayor LaGuardia of New York attacking them for shipping allegedly inferior goods to Latin America.

All this is a responsibility of the packaging field, because everything that moves in world trade must in some way be packaged for shipment. A good package builds good will. That is why the manufacturer of packaged goods or the maker of packaging machinery or supplies interested in export should:

1. Make an appraisal of his foreign markets now.
2. Know what his competition will be—with other countries—in the countries where he expects to sell—with other United States manufacturers.
3. Find out if he can export finished goods to those countries in which he proposes to sell.
4. Decide whether he must set up manufacturing facilities outside the United States.
5. Select personnel who will be more than "tourist" salesmen.
6. Forget his provincial ideas and be ready for his place in the new world order.

MEMO

ON

CLOSURE SERVICE

However distinguished the *name* on a bottle...

the *lasting* quality of its contents depends on the security of its Cork Closure.

Nature provides the raw material...

Mundet, with 79 years experience in the selection and fabrication of Cork...

provides the bottler with Cork Closures so dependable in their sealing service...

as to make them responsible for the good name of the product.

MUNDET CORK CORPORATION
CLOSURE DIVISION
65 SOUTH 11TH ST., BROOKLYN 11, N. Y.
OFFICES IN MANY CITIES



Dry-ice control

(Continued from page 160) was not disturbed at any time during the test. Results were as follows:

Time in hours	Temperature of fish in deg. F.
At start	37½ to 41
12	31 to 42
23	29 to 41
35	28½ to 40½
39	28½ to 45½

There remained 9½ lbs. of dry ice at the end of the test.

In another test of an identical package, the environmental temperature was maintained around 75 deg. F. for 20 hours, and 17½ lbs. of dry ice were used at the start. Results were:

Time in hours	Temperature of fish in deg. F.
At start	37½ to 38
6	32 to 42
12	31 to 43
20	30 to 44½

This test was discontinued after 20 hours because the temperature of the fillets in parts of the container at no time was lower than the initial temperature, and it continued to rise. There remained 9¼ lbs. of dry ice at the end of the test.

It will be noted that these tests of the Atlantic Coast Fisheries box were made at room temperature. It was concluded that although this package was fully satisfactory for shipment in refrigerated cars and trucks, in which temperature of about 50 deg. F. is normally maintained, it might not be satisfactory for general adoption by the filleting industry. Government technologists point out that Atlantic Coast Fisheries has equipment for prechilling to as low as 32 to 33 deg. F., whereas most fish processors cannot prechill to such low temperatures and an initial temperature of about 40 deg. F. is more common.

The Government men concede that this effective prechilling, plus refrigerated shipping at 50 deg. F., make an effective combination for long-distance shipping, up to four days, in the Atlantic Coast Fisheries package.

For unrefrigerated shipping, however, the College Park laboratory recommends a modified package which was developed and tested later. In this package, the insulation under the dry ice is changed to a rigid 6-ply Merkle pad, 1¼ in. thick, and that over the dry ice to a flexible 2-ply pad. Additionally, a 4-ply Merkle pad, 25⅜ by 11⅜ in., is placed in the bottom of the shipping container with a 1½-in. overlap turned up at each end, making it possible to reduce thermal leakage by covering the seams and cracks in the bottom of the shipping container with an insulating material. An identical 4-ply pad is placed at the top of the package. These two pads replace the corrugated liners used by Atlantic Coast Fisheries.

With the improved package, the following temperatures were obtained in the fish when 23½ lbs. of dry ice were placed in the "ice box" at the start of the test:

Time in hours	Temperature of fish in deg. F.
At start	37 to 41
24	30 to 38
48	29 to 36½
67	30 to 37½

Four pounds of dry ice remained at the end of the test. One fish fillet had a slight surface freeze or "hip" on the side closest to the dry ice. A slight surface freezing or "nipping" on the layer of fillets closest to the dry ice was considered desirable, since it was indicative of near-freezing temperatures. The appearance and odor were unchanged.

In general, it was found that when packages containing small amounts of the dry ice were re-sealed and held overnight in a refrigerated room at 40 to 45 deg. F. without additional dry ice, the temperature of the fish rapidly dropped to 30 to 32 deg. F. These cold temperatures were maintained as long as the dry ice remained. These findings suggest that packages containing small amounts of dry ice may be stored in cold rooms on receipt of shipment without more icing.

Experiments were performed to determine the amount of dry ice that was necessary for different periods of refrigeration at outside temperatures of approximately 70 deg. F. The amounts of dry ice in the "ice box" were varied, and the temperature of the fillets recorded. Each test was continued until the temperature in the fillets began to rise rapidly.

The data on quantity of dry ice used for different periods of satisfactory refrigeration are represented in Table I.

TABLE I.—POUNDS OF DRY ICE USED IN A SHIPPING PACKAGE CONTAINING TWO 20-LB. FIBREBOARD BOXES OF HIGH QUALITY UNFROZEN COD OR HADDOCK FILETS FOR VARYING PERIODS AND OUTSIDE TEMPERATURES

Period of packing	Outside temperature range, deg. F.		
	35-55	55-75	75-90
Hrs.	Lbs.	Lbs.	Lbs.
24	7-9	12-13	16-22
36	11-14	17-18	24-30
48	15-17	20-21	28-34
60	18-19	22-23	*
72	19-22	25-26	*
96	23-27	30-31	*

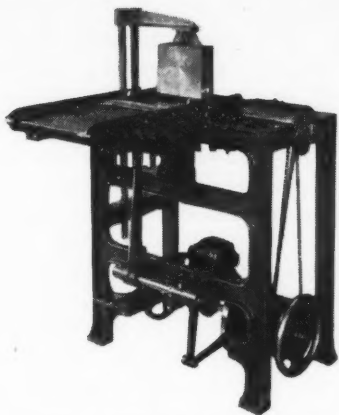
*Tests under these conditions were unsatisfactory.

Experiments were also performed to determine the effect of outside temperature on the length of satisfactory refrigeration. It was found that when a shipping package contained 22 to 24 lbs. of dry ice for each 40 lbs. of fillets, satisfactory refrigeration was obtained for 36, 60 and 96 hours, respectively, for hot, moderate and cold outside temperatures.

High temperatures outside the package had a considerable effect on those within the container. When the temperature was as high as that commonly encountered during hot weather, the temperature of some of the fish farthest from the dry ice rose beyond desirable limits, after a long period, although an excess of dry ice was used. In a typical 48-hour experiment, during which outside temperature varied from 75 to 90 deg. F. the following temperatures were recorded:

Time in hours	Temperature of fish in deg. F.
At start	44½ to 48
24	35 to 42
48	33 to 52½

After 48 hours the temperature rose rapidly. The same effects were obtained in all the experiments at high outside temperatures. It is to be noted that the higher tempera-



PETERS JUNIOR CARTON FORM-
ING AND LINING MACHINE
Sets up 35-40 cartons per
minute
One operator required

Serving the Food Industry **in WAR as in PEACE**

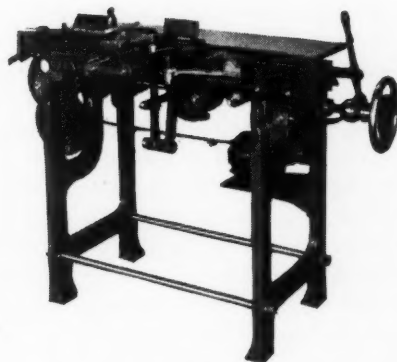
WHEN Limitation Orders were put into effect, companies who had these machines were fortunate in that they knew from previous experience they had no worries as far as their present equipment was concerned. They knew their PETERS Machines were rigidly built for many years of satisfactory performance and were precision engineered when they were constructed.

OVER a period of forty-three years, PETERS has earned this reputation which is a guarantee in itself when a company installs new machines for the first time.

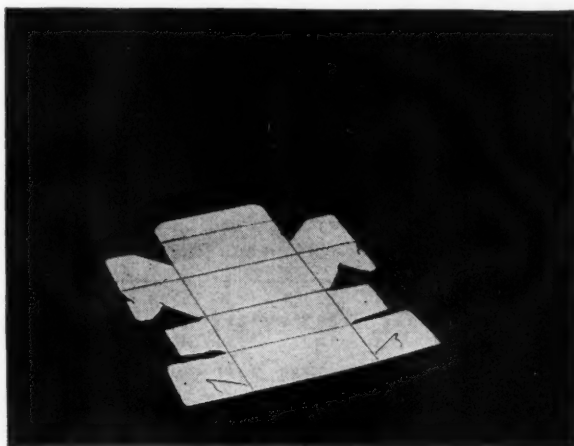
AT the present time our entire personnel is devoted to doing all we can to bring the War to a successful conclusion as soon as possible. We are now producing large quantities of parts for planes, tanks, and submarines in addition to other equipment of a secretive nature. This experience will stand us in good stead when Peace again is restored and normal production of our regular line of equipment is resumed. New materials and manufacturing processes will be used, wherever practical, in building these machines for the future.

IF you have a packaging problem and are unable to obtain a priority, ask us to work it out with you now so you will be in a position to get delivery as soon as priorities are lifted. Post-War orders are being listed in the order of receipt and they will be delivered in accordance with this schedule. From all indications there will be a great demand for equipment after the War and unless your orders are placed now there probably will be a considerable length of time to wait for delivery.

Send us a sample of each size carton you desire to handle and we will be pleased to recommend machines to meet your requirements. Of course, there is no obligation.



PETERS JUNIOR CARTON FOLDING
AND CLOSING MACHINE
Closes 35-40 cartons per minute
No operator required



Type of die-cut cartons handled on machines

PETERS MACHINERY CO.

4700 Ravenswood Avenue, Chicago, Illinois

ture was found in fillets in the ends of the boxes which are farthest from the dry ice; whereas, the colder temperature was found in the greater proportion of the fish.

Reporting on their tests of the package, E. F. Kapalka and R. H. Flowers, technologists at the College Park laboratory, state these conclusions:

"When the shipping package containing 40 lbs. of fillets was kept continuously at outside temperatures of 75 to 90 deg. F. for more than 48 hours, unsatisfactory temperatures, above 50 deg. F., were obtained in parts of the containers farthest away from the dry ice. Therefore, at high outside temperatures, packaging is limited to periods of 48 hours or less. If the package is placed in a cooled atmosphere, as in a refrigerated car or truck, the period can be extended considerably beyond the 48-hour period. Successful packaging tests for periods up to 90 hours' duration have been made when the outside temperature varied from 65 to 75 deg. F.

"It appears that 70 to 75 deg. F. is a critical outside temperature range for this package, below which the cooling effects of the dry ice predominate over the heating effects of the environment. Above this critical range, the temperature in the package farthest from the dry ice becomes too high after 48 hours, although a sufficient amount—28 to 34 lbs.—of dry ice was used. Greater quantity did not reduce temperature.

"The results of this investigation indicate that it is feasible to use dry ice to refrigerate fresh fish fillets packed in corrugated paper containers for shipment. Under certain circumstances, exposure of fish to carbon dioxide has been found to improve the keeping quality, and longer periods of packing may be possible with dry ice than with wet ice. A package containing dry ice and fresh fish fillets can be made compact, so that it can be shipped easily together with other materials in railway express cars. Packages containing dry ice are dry and there is no danger of water damage to other goods, as would occur when water ice is the refrigerant."

Some parties concerned with the development of the fish box are now experimenting with a solid fiber outer container with an insulating liner, which may give superior results. In this connection, Hugo W. Nilson, acting technologist in charge of the Fish and Wildlife Service laboratory, comments:

"Other improvements in dry ice packaging of fresh fish fillets can undoubtedly be made after further experimentation. Large markets far from producing centers should be opened to the fishery industry during the summer months if fresh fish fillets can be kept at a suitable temperature for periods up to four days when outside temperature is 80 to 95 deg. F."

Credits: Corrugated and fibre containers and corrugated liners, Container Corp. of America, Chicago. Insulating pads, Merkle Corp., Philadelphia. Dry ice, Pure Carbonic Co., New York. Cellophane wrappers, Dobeckmun Co., Cleveland.

Survey of current practices—

(Continued from page 137) and then samples sent to our branches and salesmen for their comment. If any changes are suggested, the Packaging Committee reconsiders the package with the changes and makes a final decision. Once again the package is sent to the Executive Committee for official approval and, when approved, goes into the package line.

"This may seem to be a cumbersome system, but we have found it to work swiftly and efficiently. The advantage of the multiple viewpoint far outweighs any disadvantages."

* * * * *

"The function of developing a package follows somewhat

the following lines: (a) Physical specifications are developed by our physical laboratory which is charged with the responsibility of determining the type of materials to be used, sizes, etc. They, of course, work in close cooperation with the production department. (b) Art work: We have obtained best results in package design by employing a professional designer. In some instances we do use the services of suppliers of packaging materials. We also have an artist on our staff who helps out with minor problems. (c) Labor copy is controlled in one central department. This is necessary in the drug business due to the stringency of the Food and Drug Laws. The development of copy, however, is a cooperative effort of the scientific, merchandising and legal departments. (d) All of these functions are coordinated in a packaging committee. The head of our merchandising committee is chairman of this group. It includes representatives of the sales department, the advertising department, the physical laboratory, the purchasing department, the scientific departments and the production department."

One large, well-managed and successful company that has neither a packaging department nor a packaging committee makes studies to obtain information on inventories, opinions of the trade on needs, merchandising and collateral advantages and also secures complete data on the competitive situation. Following this exhaustive research, actual production of the package itself is entrusted to the advertising agency.

Another large and successful organization which has no packaging department maintains a well-organized new products department which works with the production and quality control departments. In addition, this concern's staff includes men who constantly check on old materials and investigate new ones submitted to them for possible use. All this provides the elements of a package development department, though the company claims that it has none.

One company says that it has a broad line of products requiring several thousand different pieces of material.

"Several years ago the design for our printed materials was standardized and this minimizes somewhat the scope of the development work required for any new package, reducing that development to the individual container. If, in the development of a new package for a new product, some new container is required, development work is handled by our package material development unit."

Constant experimentation with new materials and new methods is recommended, in addition to objective work on less expensive designs for established packages.

Situations vary so widely in individual companies that the writer is reluctant to formulate hard-and-fast rules for the establishment of a package development department.

Assuming the necessity for such a department, it probably would be advisable for the individual company at the outset to inventory its own situation and determine how it stands in relation to its competitors—not alone with respect to the facility with which package developments are undertaken and effected but with respect to actual results attained. Second, of course, the type of organization which best meets company requirements must be determined.

Finally, industry must evaluate its experiences with package development so that a desirable amount of standardization may be introduced into the organization and procedures of package development departments, into the training curriculum for packaging engineers, and into all other aspects. Such standardization will not only benefit industry but will enhance greatly the professional status of packaging.

1853 - 1944



We take this opportunity to thank our friends in the Paper Box and Allied Industries for their understanding and forbearance in these difficult times.

The most satisfying result of our 91 years of service is the continued confidence which you have vested in us.

It is only natural that because of Government requirements we have been compelled to curtail production of our specialty boards for box manufacturing, but we are now planning new products of high-quality and merit for the postwar era.

We intend to maintain our usual progressive position in supplying the entire paper box field with our recognized high-standard of quality boards.

THE BUTTERFIELD-BARRY COMPANY
INCORPORATED

174-178 Hudson Street

New York, N. Y.

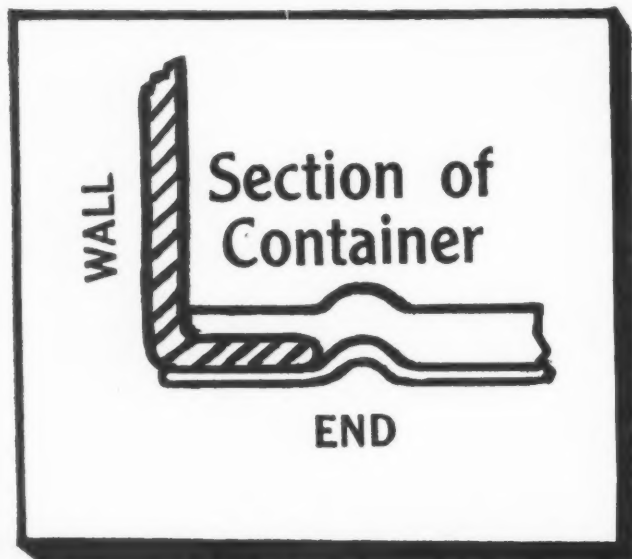
MARCH • 1944

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Paper can from down under

(Continued from page 115) over in such a way that the curled bottom edge holds the disc. A second disc, glued side upward, is inserted in the heated intaglio bottom die and one light stroke brings the two discs firmly together, sandwiching the curled end of the container's side wall. For maximum strength at this critical point, the die debosses a ring around the outer edge of the end, as shown in Fig. 3. At the same time a trademark, can be embossed or debossed.

Identical methods are used to produce the container and the closure. If desired, a paper label may be substituted



for the paper disc which forms the top of the closure, with some loss of strength. Decorative effects may be obtained by gluing on decorative paper, as shown in the Yardley lipstick holder, which is an attractive red, blue and gold package. This particular lipstick holder has the die-formed end at top, but an ordinary "cartridge" end at the bottom.

The Australian company has been producing with this method since 1942, with "very satisfactory results." Production technique is said to have proved very simple, and it is pointed out that the dies required are inexpensive, since they can be made of mild steel and require no hardening.

Credit: Containers by Argent Manufacturing Corp. Pty. Ltd., Waterloo, Sydney, Australia.

Effect of heat sealing—

(Continued from page 163) and general behavior of these cellophanes under controlled conditions of temperature, pressure and contact time. It emphasizes the destructive effects of high temperatures upon the coatings and their erratic behavior, possibly due to impairment. The efficiencies of these cellophanes were not impaired by a one-second contact between sealing jaws at 285 deg. F. However, the permeability of the heat-modified areas was increased 3 to 8 times when the sealing surfaces were maintained at a temperature of 385 deg. F. This indicates that the lowest sealing temperature commensurate with firm bonds is desirable. Because coatings vary in behavior during sealing, it is desirable to adjust temperatures to coating types. The application of 450 deg. F. was markedly destructive to the three cellophanes included in this study, in one case increasing the permeability of the heat-modified area 60 times

over that of an equivalent area of the untreated sheet.

Pressures were significant in the case of the "imprint" heat treatment of single sheets of cellophane; 10 lbs. per sq. in. caused less impairment than 50 pounds, other conditions being equal.

Lack of uniformity here is further indication, however, of erratic behavior, possibly due to conditions not under exact control. The efficiencies of "overlap" seals appear to be less affected by variations in sealing pressures than the experimental "imprint" type of treatment on single thicknesses of cellophane.

Moisture-resistant cellophanes play a prominent part in the protection of packaged commodities against the gain or loss of water vapor. Recent experience in food research emphasizes the importance of this requirement, which deserves more attention in the future than it has received in the past. Future packages should be carefully designed to fit the requirements of a specific product, in order to assure retention of natural qualities.

Acknowledgments

We appreciate the suggestions made by A. L. Pitman in connection with the work and the assistance of Alice Johannecht, who carried out the numerous vapometer determinations, both of this Laboratory.

Will they last?

(Continued from page 92) tective qualities which must be provided in the package.

4. Secure accurate data about all available packaging materials both new and old used either singly or in combination which, through impartial and accurate testing, can be shown to possess the necessary protective qualities and be proved potentially suitable.
5. Study the structural design of the package to develop the best possible style in relation to furnishing maximum protection for the product, most effective use of materials, economy, consumer convenience.
6. Determine how the package may be used in the factory most economically and efficiently, either with existing equipment or readily available hand, semi-automatic or fully automatic equipment, depending upon contemplated volume.
7. Study how the package may be made to meet the practical needs of the retail store owner as to storage, display and handling, as well as to enhance the attractiveness and profitability of his store.
8. Determine how to build maximum merchandising value in the package, i.e., to attract the consumer's attention pleasantly to win her confidence by showing what the product is, what it will do and how to use it correctly, and finally, to stimulate in her the desire to buy it immediately.

The value of such a systematic study to the manufacturer of a consumer product is that it gives him a very definite basis on which to confer with the manufacturers of each packaging material and kind of package; proving its real value for his particular product. While it probably will not discourage the current speculation for and against many of the conversion packages now in use, it will certainly provide the thoughtful manufacturer with a safe and sure way of answering positively for himself the pertinent question, "Will my conversion package last in the light of post-war conditions?"

IT'S A "PACKAGED" WAR

● The development of packaging by American industry deserves much credit for the success of our armed forces at fabulous distances from the sources of supply. War materials that have run the gauntlet of enemy submarine and air attacks for thousands and thousands of miles would be useless if not finally delivered in good condition.

With thousands of different items, from bullets to airplanes, now being packaged for the largest armies ever conceived, the demand for the materials and methods of war packaging alone exceeds the total of any previous peace-time packaging. And there still remain very large packaging requirements for essential civilian use.

Not only are the demands extensive but the requirements are unusually difficult. Shipments must be protected against the humid heat of the Solomons, the furious cold of Iceland and the Aleutians, the sand-laden winds of Africa, and the corrosive salts of the seven seas. Protection, too, must be provided against insects which can enter the tiniest crevice or eat through the toughest non-metallic material.

In spite of this overwhelming demand and the difficult requirements, Bostitch has tried to take care of as many civilian needs as possible. Bostitch will increase its production for civilian uses as rapidly as increasing supplies will permit without lessening its one hundred per cent effort to help win the war.

Some of the interesting applications of Bostitching in packaging for military use are listed below, to illustrate the essentiality of this work:

Tacking padding to cradle of bomb box;
Sealing powder bags;

Fastening canvas covers on machined end of steel pipe;

Tacking zinc tags on shipping cases for war zones;

Sealing waterproof bags to protect delicate instruments;

Sealing bags of moisture-absorbent chemicals for packing with delicate metal instruments, to prevent rust from moisture in the air;

Making grommets to protect rotating bands on large calibre shells;

Assembling boxes for hand grenades, ammunition, bomb fins, fuzes, clothing, food, and other ordnance, quartermaster, and medical supplies;

Tacking oil paper and felt linings into large wooden boxes for shipping wings and fuselages.

A tiny Bostitch staple
...linking production
and use

"What Next!"

THIS IS the question asked by many customers... surprised by the wide adaptability of Bostitching in speeding production... from fastening fragile glass bottles onto display cards... to stitching large fibre shipping containers. "What next!" is the question we are *all* asking ourselves as war conditions improve and new production opportunities loom in sight.

Bostitching can solve many fastening problems... often saving valuable time—as much as 50%—over taping, tying, gluing, nailing... providing a stronger, safer fastening... secure against moisture and many other hazards. An every-day example is assembling and sealing shipping cases... also salvaging and repairing used cases, now so important.

"What next!" Although Bostitch products are still engaged in war work all over the world, we are planning *now* with our customers for better days:

New Bostitch "When-Available" Plan

... will help *you* to prepare and help *us* to plan for the revival of civilian industries. Send for details.

Bostitch (Boston Wire Stitcher Company), 52 Duane Street, East Greenwich, R. I. (Bostitch-Canada, Ltd., Montreal).

Right: Bostitch Autoclench... one of over 800 peacetime models.

BOSTITCH

AND FASTER
fastens it better with wire

ALL TYPES OF STAPLES APPLIED BY MACHINES
ALL TYPES OF MACHINES FOR APPLYING STAPLES



How to organize—

(Continued from page 140)

3. Other factors of minor importance
- C—Complete manufacturing specification of package materials and operations—
 1. Weights of applied coatings adhesives, etc.
 2. Machine kind and operating details
- III. Specifications of currently used finished packages.
 - A—Mechanical specifications—
 1. Package form, dimensions and composition
 2. Strength and durability factors
 3. Weights and areas of all component parts and elements
 - B—Chemical specifications. Length of protection of contents under deteriorating conditions—
 1. At normal conditions with usual product
 2. At accelerated conditions with
 - a. Usual product
 - b. Comparative contents such as CaCl_2 , etc.
 - C—Manufacturing specifications—
 1. Kind and operating details of filling, forming, closing and similar equipment and operations
 2. Data on temperature, time and pressures of heat sealers or composition and weight of adhesives
- IV. Research on new package forms and materials.
 - A—Comparative tests against currently used materials—
 1. Mechanical and operational factors
 2. Chemical functions
 3. The development of improved and new methods of testing and evaluation
- V. Research and testing for packaging characteristics.
 - A—Tests to evaluate mechanical properties—
 1. Density
 2. Abrasiveness
 3. Other mechanical properties
 - B—Tests to evaluate chemical properties—
 1. Degree and rate of effect of outside deteriorating elements
 - a. Water vapor
 - b. Water
 - c. Air and other gases
 - d. Age and light
 - e. Other factors
 2. Degree and rate of product deterioration by
 - a. Loss of volatile components
 - b. Change of state
 - c. Temperature
 - d. Other factors

This pattern of the scope and activity of the packaging laboratory is not complete in every detail, but broadly covers the kind of work for which the laboratory must be staffed and equipped. Obviously a technically trained person must check and supervise such laboratory operations and also compile and report the laboratory data into readable and useful conclusions. Many of the standardized tests and routine control work can be done by assistants having manual dexterity and good training but with no technical education.

While this pattern looks very formidable, it must be realized that it is not necessary to do all tests and operations at once and that the complete story on a material or package proceeds stepwise as the basic tests are found acceptable. The failure of a package to meet quick tests eliminates it.

However, complete data and control values should be available on all materials, packages and products that are in current use and for those which can be considered as substitutes.

A complete set of data and continuous flow of control reports will—

1. Insure the most efficient use of materials and the guarantee of product protection.
2. Allow the purchasing department to obtain materials at the lowest price compatible with performance.
3. Prevent suppliers from degrading quality or making substandard shipments.
4. Make it possible to make changes and substitutions without danger of losses.

The laboratory equipment is divided into two classes.

1. Instruments and equipment for making tests of package materials, components, physical tests, product tests.
2. Cabinets or rooms of controlled atmospheres for making accelerated package and product tests.

In both classes there are standard equipment or instruments for some of the testing while special and improvised equipment is necessary for some of the phases involving new techniques or unusual storage conditions. As the science of packaging develops, standardized tests and equipment for performing them will become available. Until then, a packaging laboratory should standardize its own procedures.

On such a basis a packaging laboratory can contribute effectively to the work of a packaging committee.

How long controls

(Continued from page 94) must be met. Transportation and utilities must be maintained in operation and expanded to meet increasing loads. Farm machinery and food-processing equipment must be provided to meet food production goals and the great industries which supply the nation and the war effort with fuel must be operated, maintained and expanded. All of these requirements must be programmed parallel with the needs of the Armed Forces.

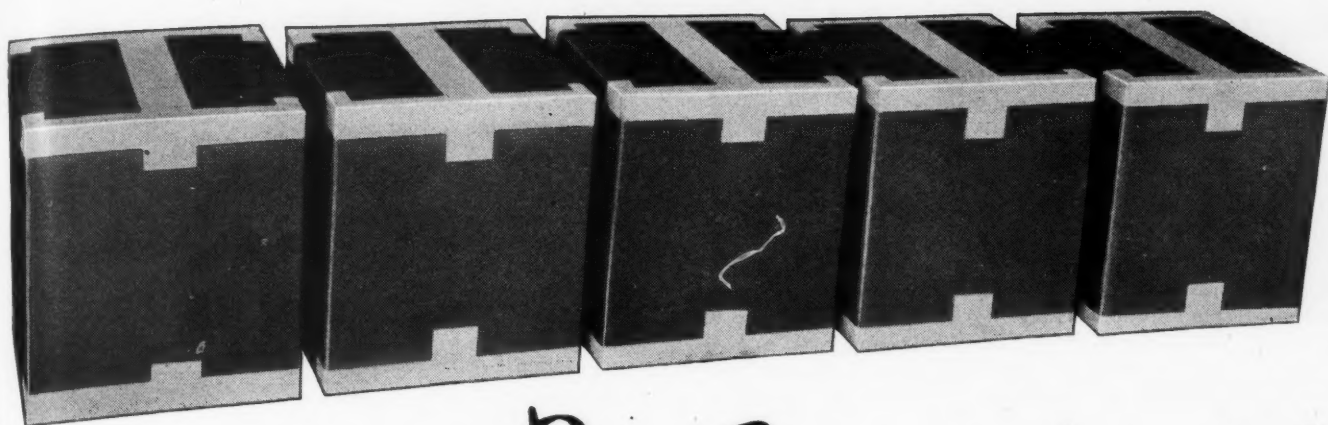
There can be no substantial diversion of resources to less essential civilian products while there is war in Europe.

WPB has established machinery for implementing promptly any shift which can be made in our productive programs to utilize fully our productive resources. Few, if any, of the Claimant Agencies have been granted approval for all of the production which they would like to have. The country's transportation systems require more repair materials and rolling stock. The oil industry could use more well-drilling equipment and productive facilities. The utilities could use additional material and equipment to safeguard essential services. Housing is still scarce in production centers.

These needs are being compared as to relative urgency so that when additional production can be authorized without interference with the essential military programs, the necessary changes can be implemented by an orderly and controlled relaxation of restrictive orders.

No class of products is more vital to the continued effectiveness of the war production program, and for that matter to the prosecution of the war, than packaging. Materials of war cannot be distributed to the battlefronts around the world without an adequate and continuous supply of containers and packaging materials. Unfortunately, primarily because of labor shortages, the raw materials needed by the container and packaging industry are in short supply and will probably continue in short supply for the duration.

It is, therefore, the obligation and responsibility of the packaging industry to continue the amazing record already achieved in conserving materials and in finding better and more economical methods of packaging our production.

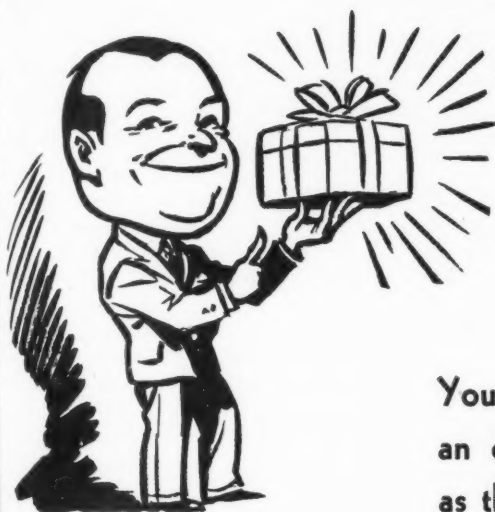


Be Consistent!

Ship your attractive
package in smart looking

Counterboy

sealed container.



Your investment in a handsome sales package demands an efficiently sealed shipping container as neat looking as the package it carries. You guarantee not only arrival in factory-fresh condition but also consistently well sealed containers that reflect the prestige of your house by using Counterboy Sealing-tape machines in your shipping room.

Counterboy Sealing-tape machines help your packers turn out uniformly, neat-looking containers. Their Automatic-Moistening Unit can be adjusted to condition, any kind or grade of gummed tape for a quick, permanent seal.

For the sealing of war shipments with water proof tape, the BETTER-PAC CLOTH TAPE MODEL (with its specially hardened cloth cutting shear and superior tape conditioning unit) has been enthusiastically recommended.

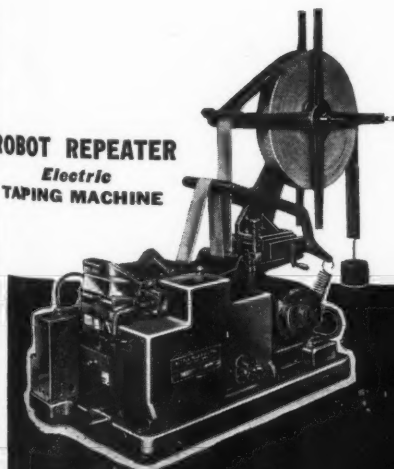
BETTER PACKAGES, INCORPORATED, SHELTON, CONN.

Sales and
Service in
Principal
Cities

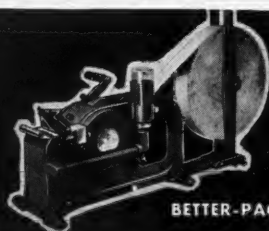


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ROBOT REPEATER
Electric
TAPING MACHINE



FOR EFFICIENT TAPE SEALING



BETTER-PAC



TAPE-SHOOTER
Junior



Mod. A

Equipment and materials

(Continued from page 172) exceptional stability, chemical resistance and wide useful temperature range. Their resistance to light and heat, boiling water or even hot alkali is outstanding in the field of vinyl chloride copolymer.

Coating of fabrics, paper, foil and other material, manufacture of film for packaging, and the manufacture of extruded and molded products are among the uses for these resins.

Vulcanized splicing makes possible the use of belting made with new synthetic rubber, known as GR-S synthetic rubber, joined to natural rubber belting, also made by The B. F. Goodrich Co. Thus, sections of this synthetic belting may be used to repair existing belting using the company's standard splicing and repair materials and directions contained in their manual.

CHROME PIGMENT FOR PRINTING INK

Conservation Order M-370, issued January 21, 1944, limits chrome pigments for printing ink manufacture only. It does not restrict the use of yellow inks by the advertiser, publisher, printer or lithographer. The National Assn. of Printing Ink Makers reports that alternate pigments are available to augment the supply of yellow inks, and that ink requirements of the graphic arts can still be met with the supplies permitted.

For your information

(Continued from page 202) mittee on the problems of distribution and equal representation encountered in such a large project. A new contest for 1944 "Printing and a Free Press" was formally announced. Students in all the Americas are invited to participate. Prizes will be awarded in each country and the two best essays from each country will enter the competition.

"Air Cargoes," a booklet written by J. D. Malcolmson, technical director of Robert Gair Co., Inc., attempts to explain to shipper the fundamentals of the corrugated box and its place in air cargo. The introduction says in part: "The advent of air express, and the coming of air freight mean new traffic departments, new regulations and new users of corrugated boxes. We feel, therefore, that a review and repetition of some of the fundamental principles that this industry was working out thirty years ago seems to be in order. . . . This is our reason for this booklet at this time."

Charles R. Cosby, executive secretary of the Label Mfgs. National Assn., was one of the committee of three attorneys and accountants that worked on the simplification of the OPA's forms A and B. The old form was 20 pages long, the new one only six. Twenty thousand of the old forms weighed 10,750 lbs. while the same number of new ones weigh only 1,400 lbs. The cost of mailing 20,000 of the old forms was \$5,400; the new ones cost only \$600, and while it took 72 minutes to read the old form the new one takes but 16. These are just a few of the astounding figures on time, paper, labor and money saved.

Folding Paper Box Assn. of America held its Annual Meeting at the Blackstone Hotel, Chicago, March 8, 9, and 10. The Board of Directors meeting on the 8th was an all-day conference which considered reports from the combined board and executive committee. General meeting on the 9th highlighted a report from President Fitzhugh on the progress made in the past year. A question-and-answer panel had well known men from the industry presiding. On the 10th there were two clinics: one on Government regulations, and one on labor relations.

The paper industry "is falling down at the moment in accepting such (Army) orders," Rex W. Hovey, director of the paper division of the War Production Board, told last month's meeting of the American Pulp and Paper Assn. in New York. He accused the industry of reluctance to bid on Army contracts, stating that in one case procurement officials received only two bids on about 15 items.

"The Army has had more trouble in placing bids in the last three months than they had in the previous two years," Mr. Hovey said. "I can promise you that if we can't satisfy them through voluntary action, the Army will get us to produce orders which will get needed products from pulp you have."

End-use reports filed with WPB by producers have shown that 45 per cent of paper production is going directly or indirectly into military uses, while 53 per cent of paperboard output is going into such uses. However, since the Army and Navy have not been getting as many containers as they need, WPB is preparing a new type of "production control" which in effect may mean allocations to mills producing for approved end-uses, Mr. Hovey said.

"If all the current uses of paper and paperboard are considered essential" a shortage of these materials does exist today, Mr. Hovey said in reply to questions. Further curtailment of a number of civilian uses of paper may be ordered, he indicated.

David Graham, director of the office of pulp allocation, told the association that while up to the present the end-use information which WPB has required of producers has been used mainly for the purpose of aiding the requirements committee in analyzing distribution within segments of the industry, the curtailment of production and increasing demands for paperboard may require that such data be used "in the determination of allocations to individual mills."

James L. Madden, assistant director of the paper division in charge of pulpwood, stated his hope that there will be no extension of pulpwood allocations beyond the extent to which they are now practiced on the West Coast and on Canadian supplies.

At an executive committee meeting, the association elected Daniel K. Brown, president of the Neenah Paper Co., Neenah, Wis., to succeed George H. Mead as president. Thirteen vice-presidents were elected to the executive committee and E. W. Tinker was renamed executive secretary and treasurer.

Plants and people

(Continued from page 200) and sales manager of Lutz & Sheinkman, lithographers, has announced the opening of his own company to be known as The Castle Co., with offices in New York.

Dr. R. A. Diehm, technical director and E. A. Throckmorton, director of sales research for the Container Corp. of America, Chicago, visited the Goodyear Tire & Rubber Co.'s new research laboratory recently to study postwar uses for Pliofilm.

Arrow Mfg. Co., Hoboken, N. J., are awarding two \$25 war bonds for each actual letter from a service man which is accepted for publication in their new advertising campaign.

Jean A. Hollander is the newly named director of consumer information for the Can Mfgs. Institute, Inc.

S. S. Snyder has been named manager of the Philadelphia division of the national adhesives division of National Starch Products Inc. The company has also announced the acquisition of an additional tract of land in Dunellen, N. J., which rounds out the ownership of that tract to some 200,000 sq. ft.

Paul L. Houston has been elected president of the Marvellum Co., after having served as vice-president since 1929. William J. Warner and Maurice A. Park were designated vice-presidents and Russell S. Bracewell as vice-president and secretary. Francis C. Heywood is treasurer. All were elected to the board.

OBITUARY

Ralph N. Humes, representative of the Hazen Paper Co., died on January 28.

Corrections—The Norwich display shown at the top of page 87 in the February issue was made by Kindred, MacLean & Co., Long Island City, and not by Einson-Freeman as stated.

In table VII on page 99 of the January issue the flip vacuum loss for the tomato juice cans stored at 70 deg. F. should have read: 1.25 lb. plate, 0.2 in. and 0.5 lb. plate, 4.2 in.

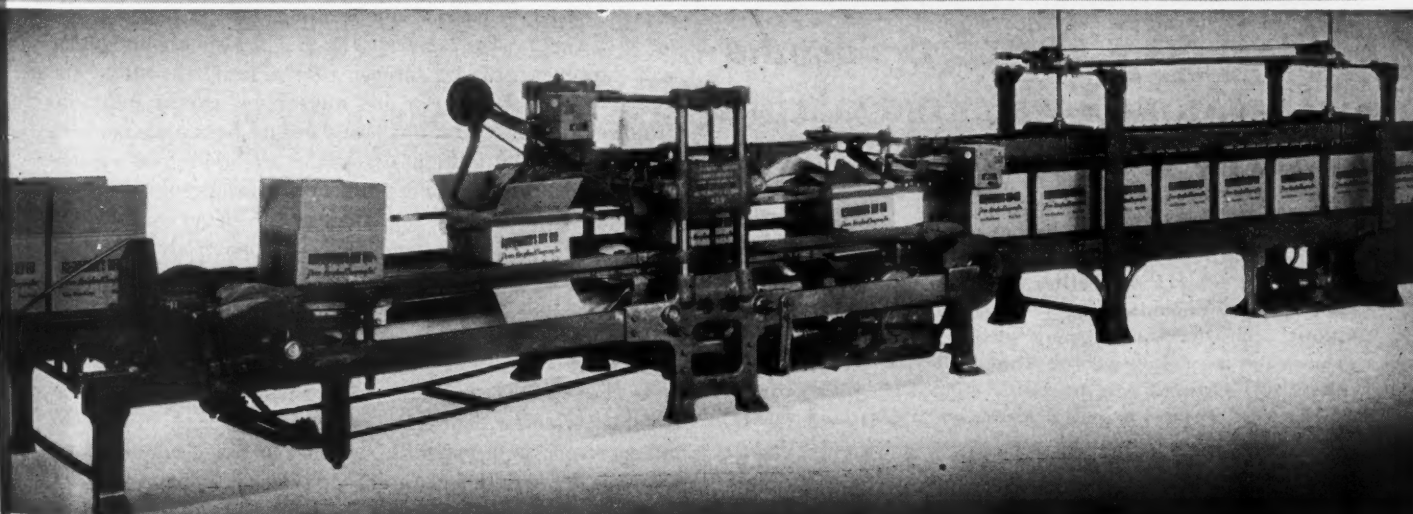
WAR

is not our business

War is as distasteful to us as it is to the average American. Yet, like him, we have pitched in to do our part.

In the same way as clerks and artists become fighting doughboys when the need arises, we turned from our peacetime pursuit of manufacturing equipment for case-packing and case-sealing to make more warlike machines.

It is good equipment and it does its job, but we are looking forward to the day (not too far off, we hope) when it will no longer be needed and we can start serving the packagers of America once more.



STANDARD-KNAPP CORPORATION

MANUFACTURERS OF CASE SEALING, CASE PACKAGING, AND CAN LABELING MACHINES
FACTORY and GENERAL OFFICES—PORTLAND, CONNECTICUT

570 Lexington Avenue
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CLEVELAND 14, OHIO

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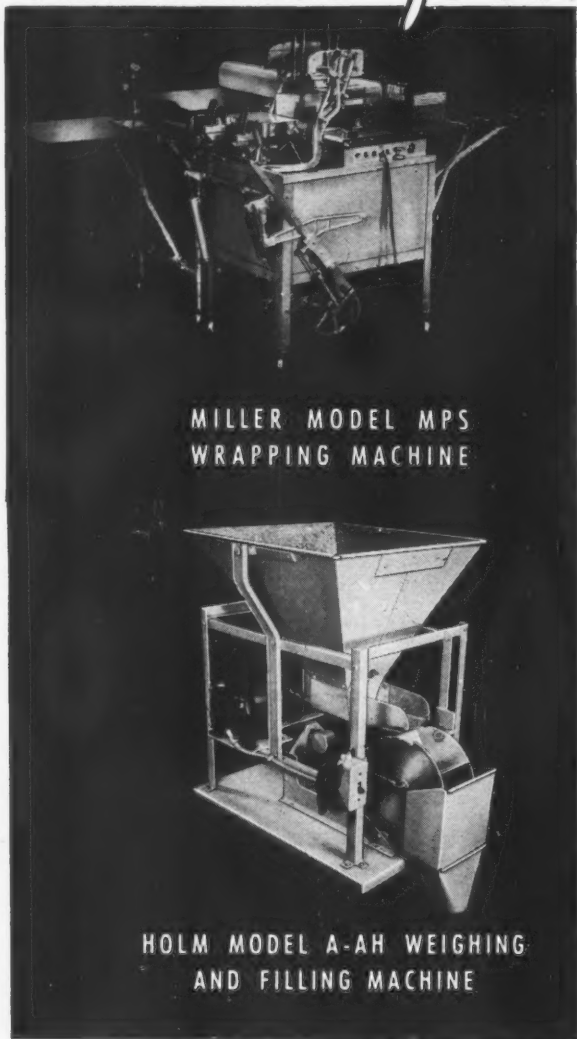
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Windsor House, Victoria Street, LONDON, ENGLAND

Machines for...



MILLER MODEL MPS
WRAPPING MACHINE

HOLM MODEL A-AH WEIGHING
AND FILLING MACHINE

- WRAPPING • SHEETING-GLUING
- BAG MAKING • WEIGHING-FILLING
- ROTARY SEALING • JAW SEALING

THESE packaging operations can be performed with almost uncanny efficiency with the equipment we offer! All Miller machines have *proven* their published advantages, thru practical, everyday plant operation on a great variety of products. If you have a packaging job that calls for wrapping, sheeting, gluing, bag making, weighing, filling or sealing . . . discuss it with a Miller engineer. Chances are he can offer you substantial economies, thru the great speed and efficiency of Miller machines. Without obligation, send for complete information.

Packaging show visitors: See them at our demonstration rooms . . . 18 So. Clinton St., Chicago!



18 SOUTH CLINTON STREET

CHICAGO 16, ILLINOIS

X-crepe—

(Continued from page 123) U. S. A., at the T.A.P.P.I. meeting in Chicago, September 21, 1943:

"A few months ago in Casablanca I was watching some of our guns and instruments being unpacked. One of these pieces was a mechanism used to direct anti-aircraft gun-fire which had evidently been dropped and the box damaged. These directors weigh a quarter of a ton apiece but they are so precise and, in a sense, so delicate, that they have to be manufactured in air-conditioned rooms where the slightest flake of dust or hint of rust is kept from their watch-like interior.

By all rights, that director in the damaged box should have been done for. We had the box opened then and there. Inside we found our mechanism undamaged.

"How was this \$25,000 instrument saved from destruction? It was very simple, really. The director had been cushioned in paper. After trying steel spiral springs and wood cantilever springs, we hit on special built-up corrugated pads wrapped and sealed in heavy waterproof paper. These pads are cheap, easy to assemble, and protect perfectly the instruments which it is so essential to deliver in serviceable condition."

Several hundred thousand X-crepe submersible bags, each made to fit a specific size corrugated pad, have been supplied for the application described above. Keeping a corrugated pad dry so that it retains its cushioning quality may be just as important in helping to win the war as preventing corrosion on a machine gun.

After the war, what?

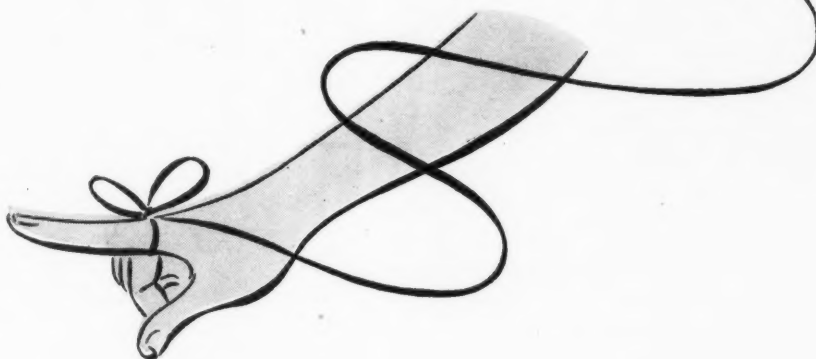
While our first duty is to win the war, there are, as we go along, lessons to be learned which may well be applied to postwar activities. It seems certain that many pre-Pearl Harbor ideas of how to pack merchandise for export shipment during peacetime are due to be radically revised. While it is not expected that peacetime merchandise will be stored in the open in the swamp lands of the Pacific, such merchandise will, however, still be subject to the rough handling and damaging effects of water and moisture in export shipment. It must be evident that much peacetime goods have not been reaching their destinations across the seas in as good a condition as when they left the manufacturer's shipping room.

It is also quite likely that the war has demonstrated that many of the packaging procedures and materials now being used will greatly improve the protection to export shipments. It may be found that some of them will do a better job of protecting at even a lower cost than did most of the prewar materials.

As far as X-crepe is concerned, it is believed that it will help to fill the need for high-grade protective materials in the field of export packaging after the war in much the same manner that it is doing during the war. It is also fully expected that when its production becomes available for civilian uses, it will again enjoy very wide usage in many of the applications for which it was used prior to the war. In addition, improved production procedures and new variations of X-crepe constructions are undoubtedly going to open up entire new fields for its use. Meanwhile, if X-crepe will help to win the war quicker, then it should be used for that purpose.

Credit: Sealing equipment, Durbrow & Hearne, New York.

We want to be REMEMBERED



TO YOUR PACKAGE DESIGNERS •

As the source of the colorful fancy papers, all so appealing to consumers and the judges of package competitions.



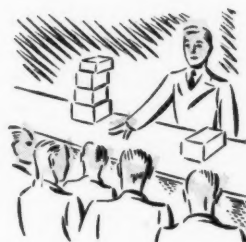
TO YOUR DEALERS •

As the organization which placed those attractive designs around your product and helped to sell merchandise when the consumer was really the boss and the product had to be right.



TO YOUR CONSUMERS •

As the unknown but potent psychologist who has made the attractive papers which create a standout product in every line, and who provides the buying urge.



TO YOU •

Just because there's a war on, do not forget we are those things and more. And do not forget we'll be offering you better, more colorful, and more attractive papers after the war.



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Typical of the highly gratifying results secured through the use of Findley's Pick-ets in wrap-around labeling operations, is the experience of various coffee companies. They were up against a high rate of "misses" ... evidently due to the fact that glass jars came in from cold cars and picked up a film of condensate, which made pick-up cement adhesion difficult.

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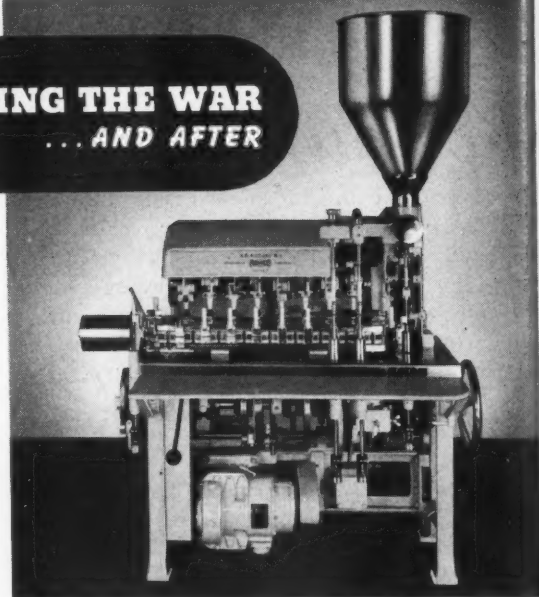
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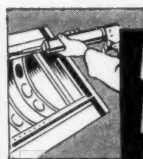
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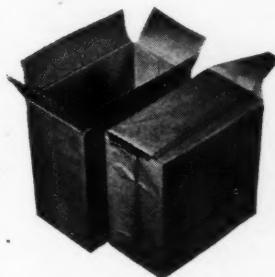
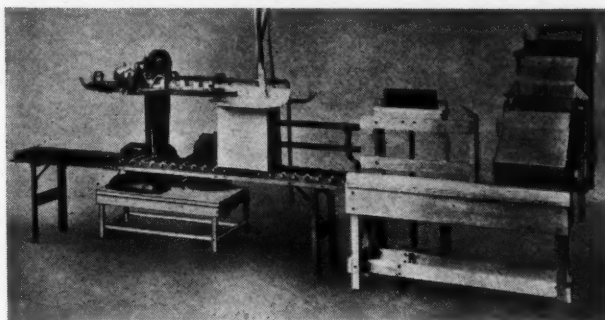
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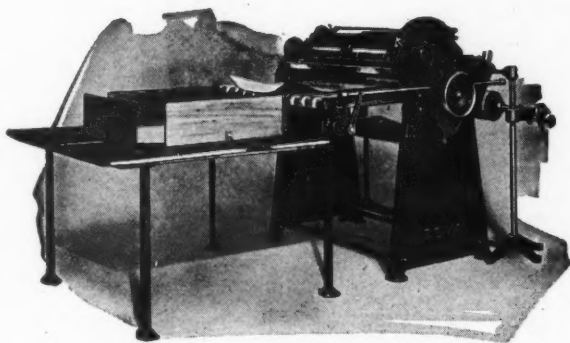
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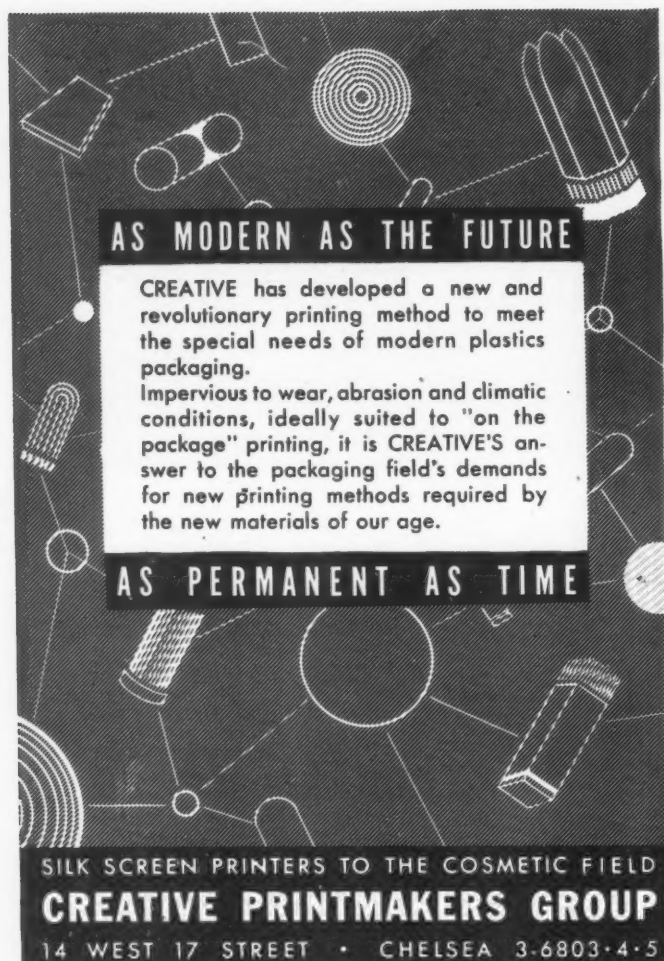
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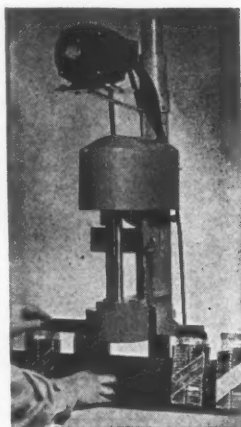
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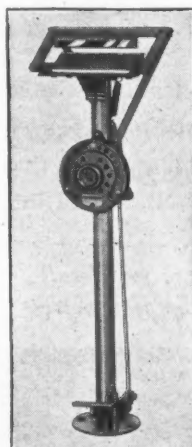
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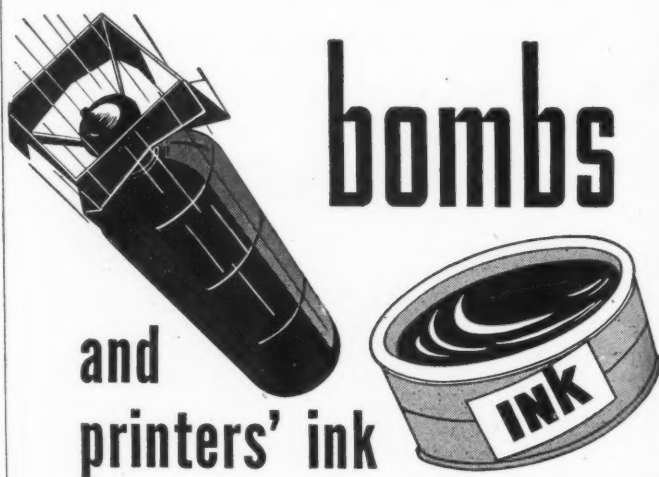
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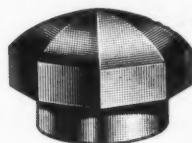
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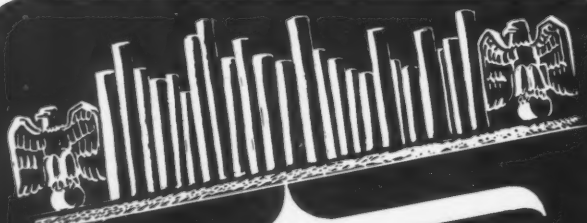
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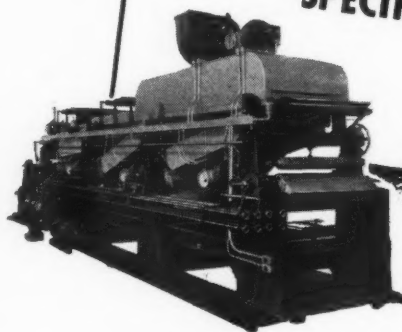
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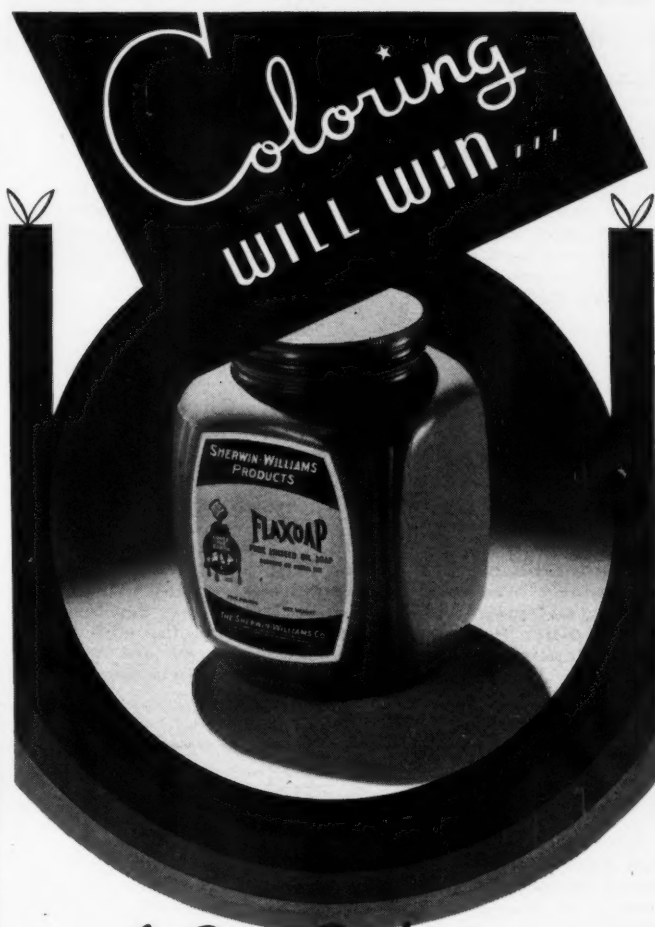
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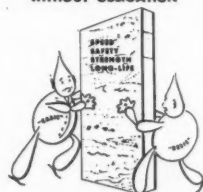
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MODERN PACKAGING
BRESKIN PUBLISHING CORPORATION
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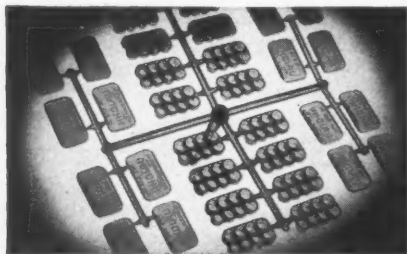
HOW'S THIS FOR POSTWAR PILLS?



Here is a strong hint of what may lie ahead for packagers of postwar pills and tablets. Soldiers going into action now carry sulfadiazine tablets packed snugly and securely in this ingeniously designed, transparent Fibestos plastic box with a separate compartment for every tablet.



Eight round depressions molded in the base of the box hold the tablets apart, keep them from breaking up. The cover fits snugly but slides easily so that a wounded man could open it with his teeth if necessary. So carefully designed is the box and so tough the Fibestos that you might stamp on it without crushing box or tablets. Finally, the heat-sealed envelope of kraft paper, cellulose film and laminated metal foil are both moistureproof and gasproof.



The boxes are being injection molded, sixteen complete boxes at a time, by the St. Louis Plastics Molding Company for the Upjohn Company of Kalamazoo. A Fibestos cellulose acetate molding compound of medium high acetyl content was selected for the job partly because it was thus possible to get an unusually rapid molding cycle and partly because good moisture resistance and dimensional stability were essential to the proper fit of lid to base.

In other words, selection of the best possible plastic for this particular job had much to do with its success—and that's where a Monsanto plastics consultant comes in handy. If you have a war or postwar job involving plastics, why not let us help?



Plastics - not recommended for spring planting

Cotton fibres, too short for spinning, are the chief raw material for two of the oldest and most widely used groups of modern, synthetic plastics. To a lesser degree, oat hulls, corn cobs, spent sugar cane, rice hulls, soy bean hulls, tobacco stalks and similar waste products of the farm have contributed successfully to commercial or experimental plastics.



But when you read glowing prophecies of incredibly cheap and plentiful plastics made from farm waste, please don't follow the prophets too literally out the window and into the clouds—at least not when you are planning the products you hope to build and sell in the critical years just after victory.



Whatever the basic raw material, a modern, synthetic plastic is primarily a chemical product. Its cost and its availability depend at least as much on the

relative complexity of the chemical processes required to produce it, as on the cost and availability of the basic raw materials.

For example, Monsanto's Lustron, one of the lightest, most colorful, most versatile and potentially most plentiful of plastics comes from crude oil by way of styrene—a much less dramatic source than oat hulls or soy beans. Yet there is every reason to believe that it will cost less to mold a product from Lustron after victory than from any other comparable plastic!



In the light of these facts, wouldn't you say that a plastics producer with a broad and varied chemical background could probably give you the best advice on how plastics may contribute to your war or postwar products? . . . Particularly a producer like Monsanto, which offers one of the largest and most versatile groups of plastics of any of the major chemical companies? MONSANTO CHEMICAL COMPANY, Plastics Division, Springfield, Massachusetts.

★ ★ ★

The broad and versatile family of Monsanto Plastics includes: Lustron polystyrenes • Vinyl acetals • Nitron cellulose nitrates • Fibestos cellulose acetates • Opalon cast phenolics • Resinox phenolic compounds • Resimene melamine compounds. Forms in which they are supplied include: sheets • rods • tubes • molding compounds • castings • industrial resins • coating compounds • Vuepack rigid, transparent packaging materials.



LIGHTNESS and STRENGTH



To combine such divergent qualities as the strength of the lion and the lightness of the lamb is an achievement that has been accomplished in the manufacture of BALL glass containers.

Although very light in weight, these containers are made tough and durable to meet the demands of high speed automatic operation at low cost.

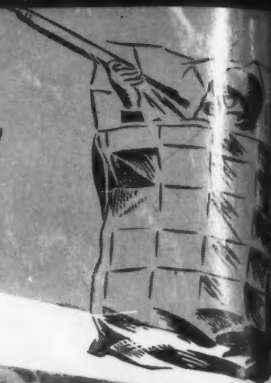
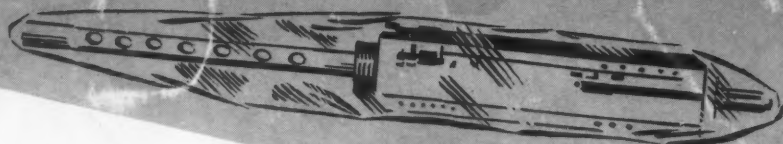
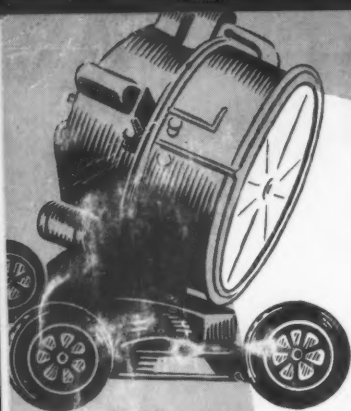
Glass packed products are seen to advantage and may be shipped safely and economically.



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A present for Civilians

In the midst of developing and applying new materials for war packaging—special envelopes and packaging methods for aircraft engines, machine guns, ration K, dehydrated foods and a host of other war products—SHELLMAR engineers have managed to develop one outstanding packaging material for essential consumer foods. You see two basic applications of the new SHELLMAR packaging material. As an envelope (No. 745) it heat-seals itself to contain dehydrated cranberries. It furnishes protection against moisture-vapor that only a metal can could formerly supply.

As a tight-wrap, (No. 680) it is heat-sealed around the Junket Rennet Powder carton, replacing unobtainable aluminum foil and showing by actual test the ability to do the job *and do it better*.

The new SHELLMAR material consumes practically no critical materials. It is a material that offers basic advantages equally desirable under war and peace. Economically it compares favorably with competing materials. Look into it now—it may fit into your reconversion plans.



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